Victory 1945: Western Allied Troops in Northwest Europe

GORDON L. ROTTMAN

ILLUSTRATED BY PETER DENNIS

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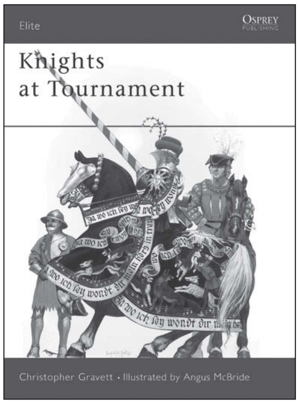
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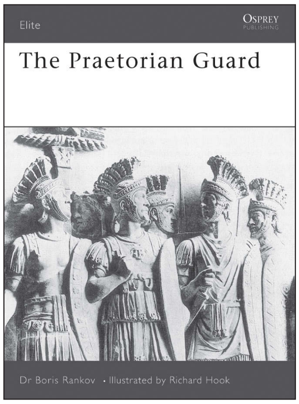
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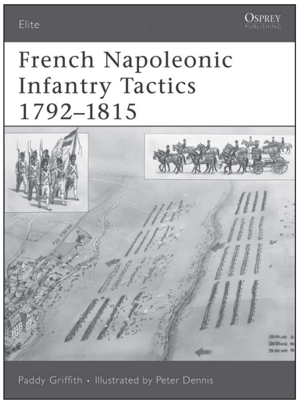
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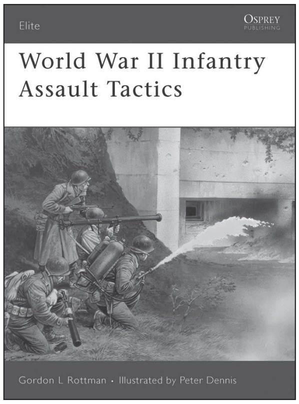
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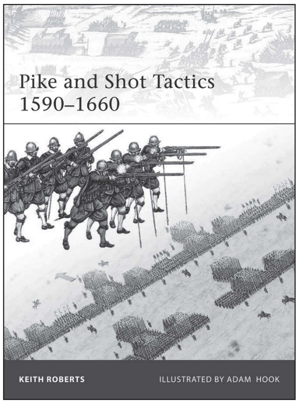
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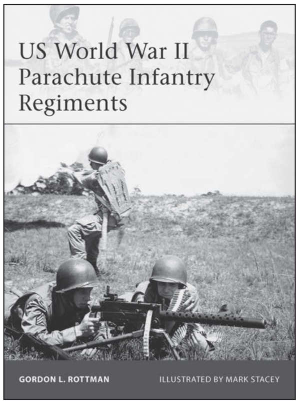
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Victory 1945: Western Allied Troops in Northwest Europe

Panzerfaust

GORDON L. ROTTMAN **ILLUSTRATED BY PETER DENNIS**

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This electronic edition published 2015 by Bloomsbury Publishing Plc

First published in Great Britain in 2015 by Osprey Publishing
PO Box 883, Oxford, OX1 9PL, UK
PO Box 3985, New York, NY 10185–3985, USA
E-mail: info@ospreypublishing.com

Osprey Publishing, part of Bloomsbury Publishing Plc
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A CIP catalog record for this book is available from the British Library

ISBN (print): 978-1-4728-0947-6
ISBN (ePub): 978-1-4728-0949-0
ISBN (ePDF): 978-1-4728-0948-3

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TITLE PAGE Gemunden, Germany, April 1945: American Red Cross Canteen Corps girls, wearing their dark gray overcoats, hand out donuts to the crew of a 76mm-gun M4A3E8 Sherman of the separate 756th Tank Battalion. The *Panzerfaust* crate at bottom right is now just firewood to heat the victors' coffee. (Tom Laemlein/Armor Plate Press)

IMPERIAL WAR MUSEUM COLLECTIONS

Many of the photos in this book come from the Imperial War Museum's huge collections, which cover all aspects of conflict involving Britain and the Commonwealth since the start of the 20th century. These rich resources are available online to search, browse, and buy at www.iwmcollections.org.uk. In addition to Collections Online, you can visit the Visitor Rooms where you can explore over 8 million photographs, thousands of hours of moving images, the largest sound archive of its kind in the world, thousands of diaries and letters written by people during wartime, and a huge reference library. To make an appointment, call (020) 7416 5320, or e-mail mail@iwm.org.uk. Imperial War Museum www.iwm.org.uk

ACKNOWLEDGMENTS

The author is grateful to Tom Laemlein of Armor Plate Press, and to René Chartrand, for their photographic support.
Extra appreciation goes to Martin Windrow for his contributions to the text.

NOTE ON UNIT DESIGNATION DIFFERENCES

British and Canadian infantry "brigades" had three battalions, like US regiments. US "groups" were also multi-battalion, regiment-equivalent commands.

British and Canadian armored and artillery "regiments" were battalion-size, their "squadrons" and batteries company-size, and "troops" platoon-size. However, US cavalry reconnaissance squadrons were battalion-size; their troops were company-size, and composed of platoons.

The British and Canadian rifle "section" was equivalent to the American "squad."

ARTIST'S NOTE

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Acronyms used in this text, in addition to standard abbreviations of unit titles:

AAA	antiaircraft artillery (British & Cdn, AA)
AFV	armored fighting vehicle (tanks, tank destroyers, halftracks, armored cars, scout cars, etc.)
AP	armor-piercing (antitank ammunition)
APDS	armor-piercing discarding-sabot (improved AP ammunition)
AT	antitank
BAR	Browning Automatic Rifle
CCA, CCB	Combat Commands A, B (within Armd Div)
CO	commanding officer
Co	company, US (British/Canadian, Coy)
FFI	Forces Françaises de l'Interieur (French Resistance)
FFL	Forces Françaises Libres (Free French Forces)
FO	forward observer (for artillery; British, FOO = FO officer)
HMG	heavy machine gun
HQ	headquarters
LAA	light antiaircraft (British & Cdn)
LMG	light machine gun
MG	machine gun
NCO	non-commissioned officer (corporals, sergeants)
OR	"other ranks" (British term for enlisted men; sometimes includes NCOs)
RC	Reserve Command (aka Combat Command Reserve – CCR)
RCT	regimental combat team
recon	reconnaissance
SHAEF	Supreme Headquarters, Allied Expeditionary Force
SMG	submachine gun
SP	self-propelled (artillery, TD/AT guns on tank chassis)
TD	tank destroyer
WP	white phosphorous (smoke & incendiary compound)

CONTENTS

OVERVIEW 4

THE AMERICANS AT WAR: 6

Funneling in US divisions ▪ Final strength and casualties ▪ US 12th and 6th Army Groups

US INFANTRY 7

Unit organization ▪ Newly introduced weapons ▪ Learning new tactics

ARMOR/INFANTRY OPERATIONS 14

Training ▪ Tactics ▪ Communications & target-marking ▪ Tank-riding ▪ Tank battalion employment ▪ Divisional organization ▪ Antitank warfare: tank destroyers – infantry antitank
River crossings – the inland navy

FIELD ARTILLERY 21

Organization ▪ Employment and control ▪ The "magic" fuse

REPLACEMENTS & SHORTAGES 23

Personnel ▪ Tanks ▪ Supplies

BREACHING THE SIEGFRIED LINE 26

The obstacle ▪ The methods

FREE FRENCH FORCES 32

Origins and strength ▪ Organization ▪ Casualties ▪ Equipment

BRITISH/CANADIAN 21st ARMY GROUP: 34

Learning the trade: Normandy, 1944

WINTER & SPRING 1944–45 35

Deployment ▪ Organization ▪ Field artillery ▪ Newly introduced weapons
Operations ▪ Attrition ▪ Replacements

ARMOR/INFANTRY OPERATIONS 46

Theory and practice ▪ Wasp flamethrowers ▪ Antitank warfare

SPREADING THE LESSONS 49

Dyke-and-*polder* fighting ▪ Night fighting ▪ Forest fighting

BRITISH 79th ARMOURED DIVISION: "THE FUNNIES" 53

Swimming, flail, and flamethrower tanks ▪ Armored personnel carriers ▪ Amphibious carriers

INFANTRY SMALL-UNIT TACTICS 55

Battle schools ▪ Notes from official publications

ALLIED ORDER OF BATTLE, MAY 7, 1945 58

SELECT BIBLIOGRAPHY 63

INDEX 64

OVERVIEW

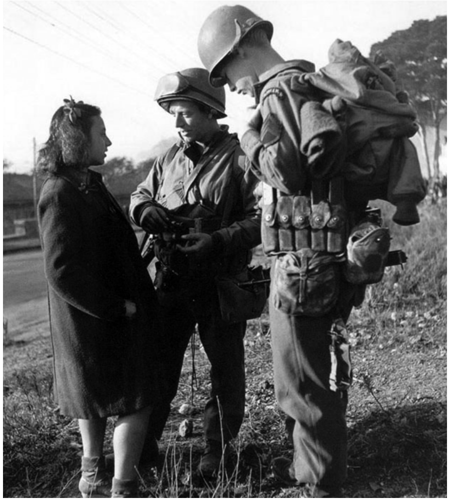
The greatest amphibious assault in history began in Normandy on D-Day, June 6, 1944. Just 11 months later Western Allied troops were on the coast of the Baltic Sea, beyond the Elbe river, and inside Czechoslovakia, and "Victory in Europe" was proclaimed at the beginning of the second week of May 1945. During those 11 months operations on a momentous and unprecedented scale were carried out successfully, though at a high cost in casualties, and hampered by unexpected delays and setbacks. The purpose of this book is to outline the changes that were experienced by the Allied armies during this campaign, seen essentially from the viewpoint of the infantry.

* * *

Allied planners had expected that if they could establish a secure Normandy beachhead, the Germans would make strategic withdrawals in order to exploit their expertise in maneuver warfare in the open country to the south and east. Nobody had imagined that the Wehrmacht in Normandy would choose to fight a prolonged battle of attrition that they could only lose. By the time the Allies finally broke out in late August 1944 – with the Canadians and British on the left (northern) flank of the eastward hook, and the US armies on their right – German forces in northern France had effectively been destroyed, and were unable to contest the very rapid Allied advances to the Seine river and beyond. However, the German decision to fight for nearly three months over every yard of the superb defensive terrain of the Normandy *bocage* had inevitably cost the attacking Allies very high losses in infantry and tanks.

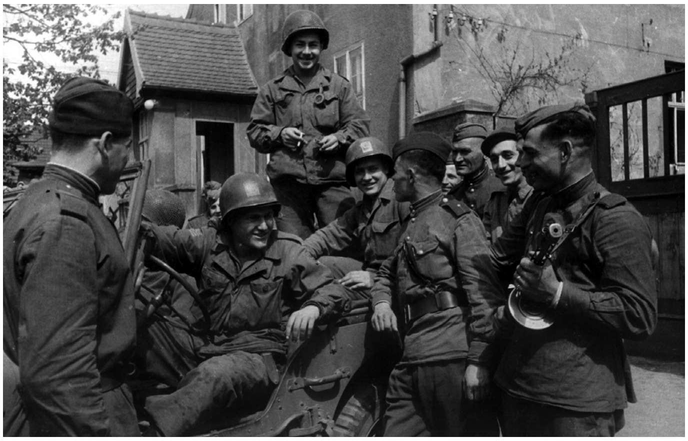
The Allies suffered the first of two serious reverses in September: the failure of Operation "Market-Garden," Second British Army's attempt to reach and cross the Lower Rhine river in the Netherlands. This was immediately followed by a delay in capturing the approaches to the vital port of Antwerp, which exacerbated an existing supply crisis and hampered further advances by all Allied commands. After further hard fighting in October–November the Allies rested just astride the German frontier, to rebuild their strength for thrusts through the Siegfried Line *(Westwall)* defenses and on across the Rhine. In December 1944 the junction of the British/Canadian 21st Army Group and US 12th Army Group was at Geilenkirchen; below this, the

Normandy, summer 1944: two US Rangers, from either the 2nd or 5th Bn, ask a Frenchwoman about any Germans nearby. The staff sergeant (right) carries, just visible beyond his canteen carrier, an M1928A1 Thompson SMG with the buttstock removed, and 30-rd magazines protrude from 20-rd pouches on his left side. Below these is the mess-kit pocket detached from an M1928 haversack, and slung on his back is a makeshift roll of blankets and a jacket. Some of his web gear has been camouflaged with dabs of green paint. (Tom Laemlein/Armor Plate Press)



US Ninth, First, and Third armies held a front roughly along the Roer, Our, and Saar rivers; south again, 6th Army Group had pushed forward almost to the Rhine, though the First French Army (which had landed in August on the Mediterranean coast of southern France) was still held up around the Colmar Pocket.

On December 16 the Allies suffered their second severe reverse – the Germans' surprise Ardennes offensive (the "Battle of the Bulge"). In bad weather, over a 60-mile front, three German armies pushed the US First Army back by up to 53 miles; but this was less than half the distance of the planned penetration, and in most places it was even less. Nine days later, clearing skies allowed the Allies to commence their counteroffensive; it would be another month before the German salient was finally eliminated, but the battle cost the Wehrmacht 730 almost irreplaceable Panzers.



GIs of 273rd Inf Regt, US 69th Inf Div with *frontniki* from the Red Army's 58th Guards Rifle Div after meeting on the Elbe river on April 25, 1945. The US soldiers wear the M1943 uniform, and sport their division's blue, red, and white insignia painted on their helmets.
The man standing in the jeep has a wrist-compass looped through his collar buttonhole; this was issued to some NCO leaders, messengers, litter-bearers, drivers, and to all paratroopers who did not receive the more sophisticated M1938 lensatic compass. (Tom Laemlein/Armor Plate Press)

The Allied goal was now to reach and cross the Rhine, punching on all the way to Berlin if necessary and forcing the unconditional surrender of the German forces. When the Allies resumed their offensive from mid-January 1945 amid the floods and forests of the Rhineland, nobody could know that the war would last only another 15 weeks (though for soldiers in combat, that's an eternity). No one could predict how long Germany would hold out; there were simply too many variables – for one, the situation on the now not-so-distant Russian Front was not known with any degree of accuracy.

In those final four months of the war the troops – both the minority of tired veterans left in the ranks, and the green replacements – were driven by a sense of urgency to finish off the enemy, but balanced by a weary caution. They were encountering fewer and fewer Panzers, and German artillery barrages were often less intense than before, but mortar and machine-gun fire were as relentless as ever. The defiance shown by German troops varied greatly: some units fought desperately, yielding each and every yard only at high cost to the Allies and themselves, while others crumbled. Many formations had been reduced to small ad hoc battlegroups; conscription was sweeping up teenage boys and elderly men, Luftwaffe ground crews, and Kriegsmarine sailors, and many units put up only token resistance before giving in. The Luftwaffe had virtually disappeared from the skies; fuel was desperately short, and the transportation system was falling apart.

On April 25, 1945 patrols from First Army's 69th Inf Div met Soviet troops at Torgau on the Elbe river. On April 30, Adolf Hitler died by his own hand as the Red Army stormed across Berlin. On May 3, British troops reached Lübeck on the Baltic coast. The next day, 10th Mtn Div from US Fifth Army in northern Italy linked up with Seventh Army's 44th Inf Div on the Austrian-Italian border; but despite the futility of further resistance, there were still German units that fought on doggedly in Czechoslovakia, Austria, and Yugoslavia for a week after the official surrender in the West on May 8, 1945.[1]

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[1] VE-Day is recognized as May 8 by the US, Great Britain, and many western European nations, but the USSR and many eastern European countries celebrate it on May 9.

Photographed in southern Germany in March 1945, MajGen Frank W. Milburn (left), commanding XXI US Corps in Seventh Army, chooses to wear a USAAF B-10 intermediate-weight flying jacket – various types were popular amongst general officers, who could indulge personal preferences. The two field officers wear the M1943 field uniform, the colonel (center) with a .45cal M1911A1 pistol in an M7 shoulder holster. (Tom Laemlein/Armor Plate Press)

THE AMERICANS AT WAR:

Funneling in US divisions

On June 6, 1944 the First US Army spearheaded the assault on Europe with 3 infantry divisions (4th, 1st, 29th) and 2 airborne (82nd, 101st) – a strength almost equaled by the British/Canadian landing forces. However, the Americans' ability to reinforce their armies soon far outstripped that of allies who had already been fighting this war for more than four years. By the time of the Saint-Lô breakout (Op "Cobra") at the end of July, there were 14 US infantry and 5 armored divisions in France. One US infantry division and an armored division plus the 2nd French Armd Div arrived during August. From August 15, in southern France, 3 US and 4 Free French infantry divisions, all veterans of Italy, plus a combined US/British airborne force, landed under Seventh US Army (Op "Dragoon"). The Seventh US and First French armies were placed under 6th Army Group on September 15, four days after the Seventh had linked up near Dijon with Third Army to their north. The Allies in NW Europe were now united into a single front.

During the September advance to the Moselle river, another US armored and 6 infantry divisions arrived. One armored and 2 infantry divisions followed in October, and 3 infantry and an armored division in November. In December 1944, 4 infantry, 1 airborne, and 2 armored divisions fortuitously arrived amidst the German Ardennes offensive. These were scheduled deployments, not a response to the crisis; the rushed deployments occurred in January 1945 and involved 6 more infantry and 2 armored divisions. February 1945 saw the arrival of 2 armored, 1 infantry, and 1 airborne division. (While this 13th Abn Div was never committed to combat, it provided replacements for the hard-pressed 82nd, 101st, and 17th.) In March the last US infantry divisions (86th & 97th) arrived; the last 2 armored divisions into the line (16th & 20th) saw only a few days of action, and numbered their casualties only in the dozens.[2]

Final strength and casualties

By VE-Day the US Army ground forces had 2,404,397 personnel in the European Theater of Operations (i.e. NW Europe). Total US Army ground casualties in the ETO over the 11 months of combat included 109,820 killed or missing, and 360,666 wounded. As a representative example of a formation that fought right through the campaign, the 4th Inf Div, with an established strength of 14,253 all ranks, suffered 4,907 killed or missing, and 17,371 wounded (156 percent of establishment). But it was the infantry who always paid the highest price: for example, in 4th Div's 22nd Inf Regt, with an establishment of 3,203, the total of killed, missing, and wounded was 9,424 (294 percent of establishment). That regiment's worst months were June 1944 in Normandy (426 killed, 229 missing, and 2,285 wounded, or 92 percent casualties); and three weeks in the Hürtgen Forest in November–December (459 killed, 53 missing, and 1,909 wounded, or 75 percent casualties). From a

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[2] For a table of divisional deployments and casualties, see p.60 of Warrior 56, *US Infantryman in World War II (3): European Theater of Operations 1944–45*

February 1945, near Colmar, France: German prisoners help to load a casualty from 12th Armd Div aboard a jeep ambulance. These could carry two litters, and were sometimes rigged to take four. The casualty wears M1944 shoepacs, which saved many soldiers from the ever-present danger of frostbite and immersion foot during the punishing winter of 1944/45. Respiratory illnesses were also very common. (Tom Laemlein/ Armor Plate Press)

D-Day establishment of 229 men, one representative rifle company in the 22nd Inf recorded 54 killed, 22 missing, and 192 wounded during their 11 months in combat – total casualties of 268 men, or 117 percent.

US 12th and 6th Army Groups

The British/Canadian 21st Army Group was the northern command on the left flank of the Allied advance. The 12th and 6th US Army Groups represented the central and southern groups of armies, respectively, controlling most US and Free French forces (though US formations were occasionally placed under 21st Army Group command for operations at the junction of the British/US fronts).

The 12th Army Group (LtGen Omar Bradley) controlled the largest US forces, with the First Army (LtGen Courtney Hodges), Third (LtGen George Patton), Ninth (LtGen William Simpson), and Fifteenth (LtGen Leonard Gerow). Each of the four armies was assigned 2–4 corps, for a total of eleven. A corps typically had 3–4 infantry divisions and 1–2 armored divisions. Some corps lacked an armored division owing to terrain, mission, and future objectives. Patton's Third Army typically had 5 armored divisions, while the First and Ninth each had 2 and the Fifteenth none. Some of an army's assigned divisions might be held in army reserve, i.e. under direct army control. Each corps possessed a mechanized cavalry group for reconnaissance, 3–5 field artillery groups, 1–3 AAA groups, and 3 or more engineer groups.

The smaller 6th Army Group (LtGen Jacob L. Devers) possessed only the Seventh US Army (LtGen Alexander Patch), with 3 corps totaling 9 US infantry, 3 armored, and 3 airborne divisions. Alongside the Seventh was the First French Army (Gén d'armée Jean de Lattre de Tassigny), with 2 corps and a total of 14 divisions, of which 3 were armored; 5 of the infantry divisions had fought in Italy, but the others were formed of recent recruits.

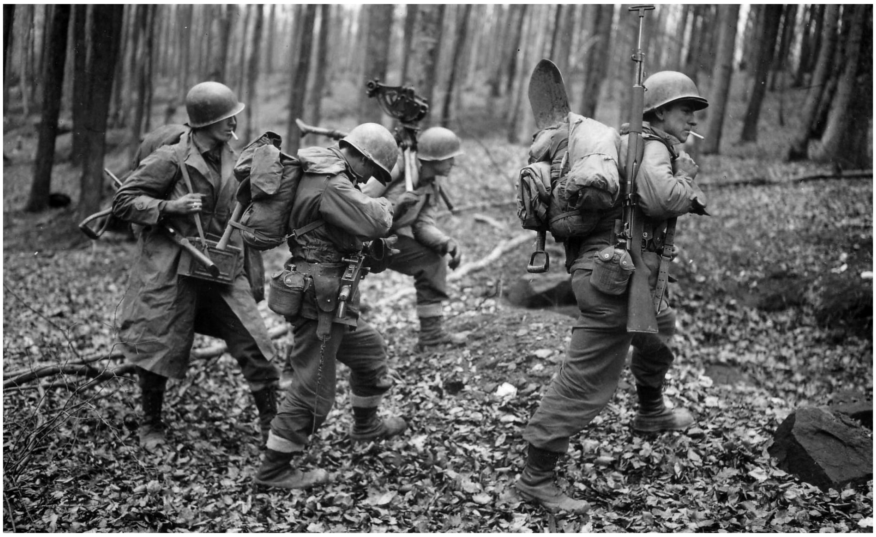
The composition of all the Allied armies and corps on VE-Day is listed in the order of battle on pages 58–59.

US INFANTRY

Unit organization

An infantry division had three infantry regiments of three battalions apiece. A regiment also had single HQ, cannon (6x 105mm pack howitzers), antitank (9x 57mm AT guns), and service companies, plus a company-size medical detachment. The battalion comprised an HQ company (3x 57mm AT), heavy weapons company (8x HMG, 6x 81mm mortars), and three rifle companies.

A heavy machine-gun squad from a battalion weapons company in German woodland, late 1944. The squad leader (right) carries an M1 rifle, with a cleaning rod inserted in the barrel. The gunner carries the M1917A1 tripod mount, and his assistant the .30cal M1917A1 water-cooled MG; both are armed with .45cal pistols. One of the regulation three ammunition-carriers is visible (left), wearing a raincoat and armed with a .30cal M1 carbine. They have M1943 field packs (the former jungle pack), but have lashed up bedrolls to their own preferences – an example of the "Willy and Joe" syndrome, so-called from Bill Mauldin's famous cartoon characters. (Tom Laemlein/Armor Plate Press)



The rifle company had an HQ (1x .50cal HMG), weapons platoon (2x .30cal LMG, 3x 60mm mortars), and three rifle platoons; each platoon had three squads (each 1x .30cal BAR).

A regimental combat team (RCT) typically had engineer and medical companies attached from division, and often tank and tank destroyer (TD) companies. One or more artillery battalions were in direct support – while

A US ARMY WINTER UNIFORM COMBINATIONS, 1944/45

Priority issue of the new M1943/1944 field uniform (see Plate B) went to combat units, and many support and service troops had not yet received it. In the extremely harsh weather any available winter clothing augmented the wholly inadequate M1941 Parsons field jacket; this had only a thin windproof shell and wool blanket lining, and did not extend down over the hips like the M1943 field jacket.

1: Hood, overcoat, and cloth-top overshoes

The herringbone-twill fatigue and the wool service uniforms were often worn layered one over the other, ideally with the more windproof fatigues over the warmth-retaining wool. The Parsons jacket would be worn under the roll-collar overcoat, made from densely woven 100 percent Melton wool weighing 32oz per square yard. This was somewhat water- and wind-resistant, and the large collar could be turned up. This carbine-armed GI, perhaps guarding a supply dump in the rear, wears a wool hood under the helmet; this was impregnated to protect against mustard gas, but was used as an expedient cold-weather hood. The antigas treatment gave the hood a slightly greasy feel, but no odor. He also wears arctic cloth-top overshoes with rubber "lasts" (the lower portion) over his leather field shoes. Raincoats were sometimes worn over the overcoats for additional layering and wind-proofing. The M1938 rubberized raincoat (see Plate D2) was the same length as the overcoat, but was single-breasted, with a four-button centerline front opening, and a smaller collar. Soldiers were issued two 100 percent wool blankets; coupled with the overcoat and raincoat, these had been considered adequate for chilly bivouacs – a judgment revealed as a serious error when troops encountered a hard winter in NW Europe. The wool "mummy" sleeping bag with a waterproof cover began to replace the standard two blankets only late in 1944, but the latter were often retained as well.

1a: The impregnated wool hood.

1b: Arctic overshoe.

2: British groundsheet, and shoepacs

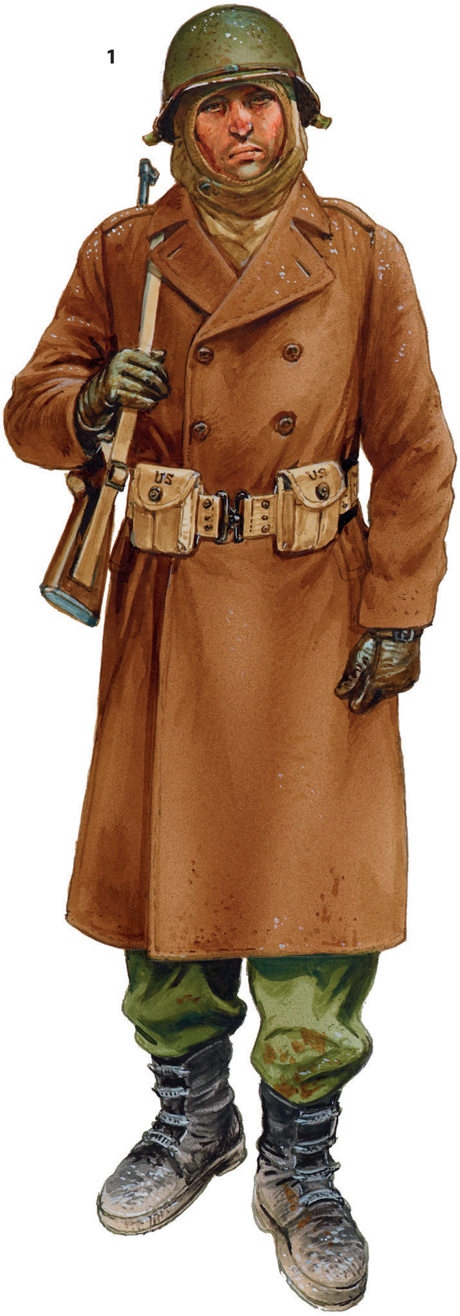
From early in 1944 the raincoat was replaced as bivouac gear by a lightweight rubberized shelter cape, with a head opening in the center allowing it to be worn like a poncho for rain protection. Two 64in x 81in ponchos snapped together to make a simple tent, and it was also used as a ground cloth or bedroll cover. To make up for shortages of ponchos, the Third US Army received 13,000 British Mk VIII "groundsheets" – 36in x 78in rubberized capes (perhaps also issued to other US formations). This ground cloth, too, could be buttoned to a second to make a crude tent, but was mainly used as a rain cape, as here. The M1941 wool knit cap or "jeep cap" was designed to be worn only by enlisted men and only under the helmet; the latter rule was so often ignored that many commanders, hating its slovenly look, banned its use in their units. This soldier also has the early 10in-high pattern of shoepacs: popular waterproof boots with rubber lasts and waterproofed leather uppers. Like A1, he wears leather glove shells with wool knit inserts – inadequate for very cold weather. Slung on his chest he carries a recently issued 2.36in M9 bazooka broken down into the compact travel mode.

2a: "Jeep cap."

2b: Leather glove shell & wool insert.

2c: Shoepac.

1



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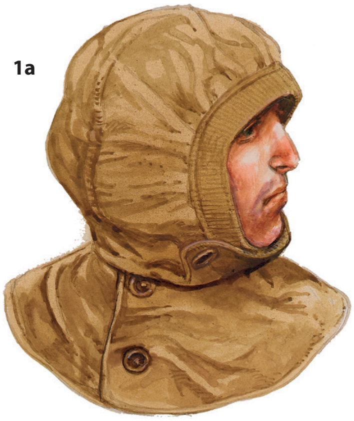

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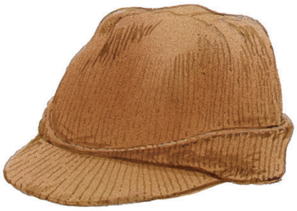

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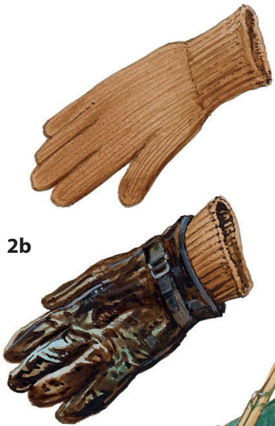

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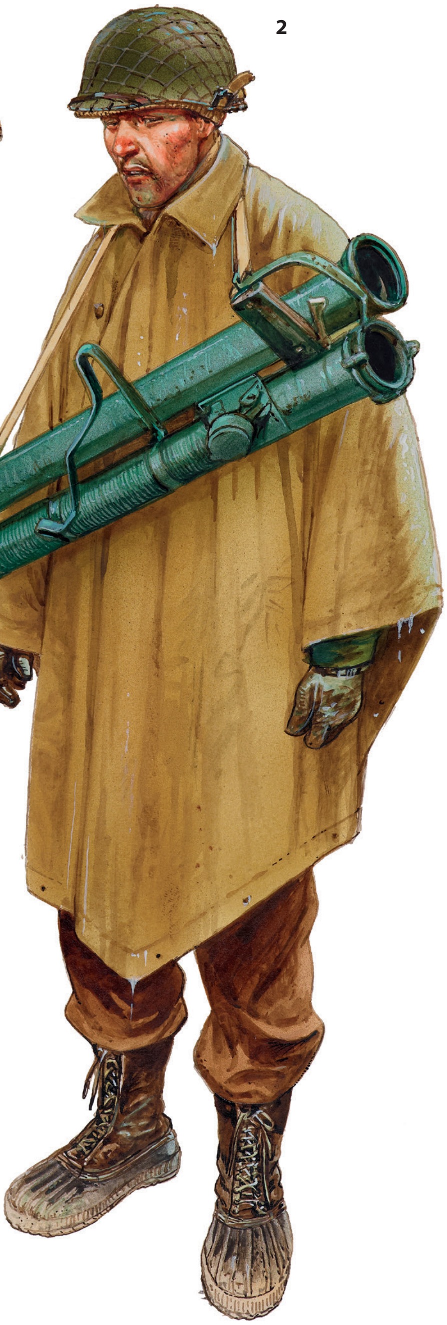

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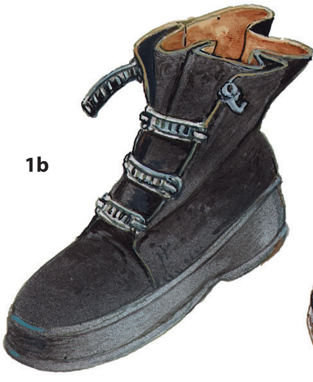

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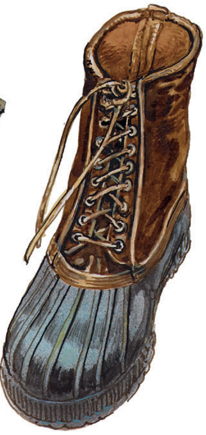
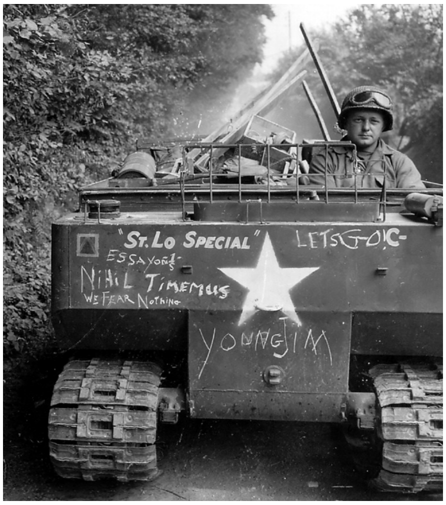


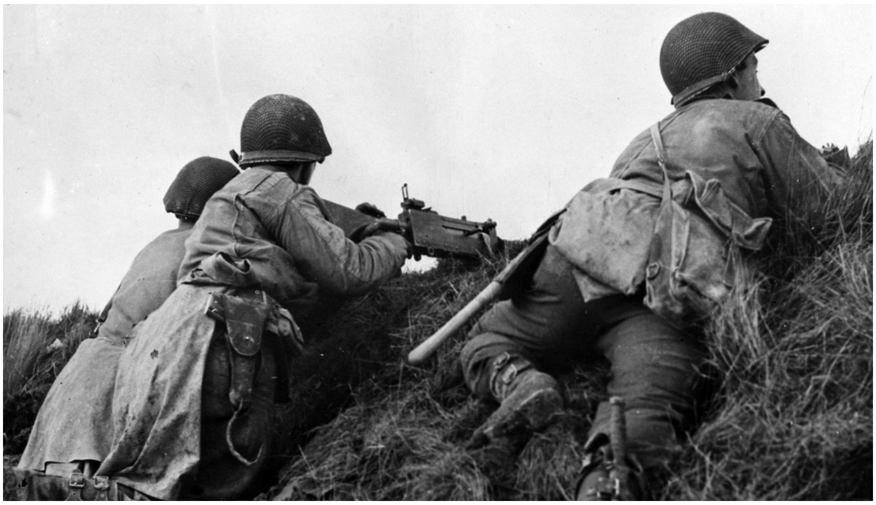


An M29 Weasel tracked cargo carrier of Co C, 121st Combat Engr Bn, 29th Inf Division. The Weasel was in use from Normandy onward (note the chalked "ST. LO SPECIAL"), and from November 1944 large numbers were issued to infantry regiments, engineer battalions and other units to deal with mud and snow, often replacing jeeps and towing ¼-ton or 1-ton trailers. They proved invaluable in the Hürtgen Forest, being mainly used by regimental and battalion supply platoons to deliver ammunition and supplies to forward positions and to evacuate casualties on the return trip. (Tom Laemlein/ Armor Plate Press)

seldom under direct control of the RCT, they provided fire support to its units as necessary. Other units frequently attached to a division included one or more engineer combat battalions, ordnance ammunition and quartermaster truck companies, and varied medical units. It was common for infantry regiments from one division to be attached to another – often a fresh regiment formerly in the division reserve relieved an exhausted regiment of another division.

Divisions usually received "habitual" or "standard" attachments in the form of one each tank, TD, and AAA battalions. Sometimes these remained with a division for prolonged periods, allowing them to familiarize and refine their tactics. However, this was not always so; for example, on various occasions the 28th Inf Div had three different tank battalions attached, five different TD battalions (one on four separate occasions), and two different AAA battalions (one on three occasions); these repeated attachments of the same battalions indicated efforts to preserve tactical familiarity. Often a division had both a tank and a TD battalion attached, but tanks were more prevalent; a tank battalion had 60 medium and 17 light tanks, while a TD battalion had only 36 self-propelled (SP) tank destroyers.

Infantry divisions were motorized except for the 27 rifle and 9 weapons companies, who walked. A division could be augmented by 6 quartermaster truck companies, each with 48x 2½ -ton cargo trucks with 1-ton trailers, but these were seldom available to carry infantry, being mostly tasked to move ammunition, fuel, and supplies. In some instances troops would be shuttled: i.e., some troops were carried forward in trucks as the remaining units marched forward, eventually to be picked up by returning trucks. However,



The .30cal Browning M1919A6 light machine gun (left) began to be issued to Airborne and some other units in late 1944. This modification of the tripod-mounted M1919A4 was fitted with a stamped metal shoulder stock, a bipod, and a carrying handle; early examples were not fitted with a muzzle flash-hider. It was not entirely successful, being actually heavier than the gun it was intended to replace. This crew wear the M1944 two-buckle combat boots; the right-hand man has an M3 trench knife strapped to his boot, and a slung ammunition-carrying bag, which among other loads could accommodate a 250-rd MG feed belt. (Tom Laemlein/ Armor Plate Press) it was found that an entire division could be moved by its organic vehicles by loading troops aboard tanks, TDs, artillery and AAA prime-movers, and the trucks of support units. This ad hoc method proved very successful.

New equipment

During the war the Allied armies received a constant flow of new or improved gear of all types. This cornucopia of material was the result of a massive (and therefore uncoordinated) system for scientific research, development, manufacturing, and distribution. The creation of new equipment might be prompted by the recommendations of various committees, often without input from the combat forces; other items were developed and offered by manufacturers without a request from the military, but many were responses to such requests. Inevitably, mistakes were made: resources were squandered due to misconceptions and poor judgment, and inadequate planning and changing circumstances led to periodic shortages and late delivery. Some new items were distributed within months of standardization after rushed testing, but in most cases it was closer to a year before they reached the troops – after final enhancements, establishment or conversion of production lines, accumulation of sufficient stocks, shipment overseas, and distribution to units.

Newly introduced US weapons

Between late 1944 and the war's end a number of new weapons were fielded. Contrary to what is sometimes assumed, some of these saw little if any action, not being issued to combat units in any quantities.

.30cal M2 carbine Production of this selective-fire version of the semiautomatic M1 did not begin until April 1945, and neither it nor the 30-rd magazine saw combat in the ETO.

.30cal M1C & M1D (substitute) sniper rifles Adopted in mid-1944, but very few saw combat, and the bolt-action M1903A4 remained in use.

.45cal M3A1 submachine-gun This improvement on the M3 "grease gun" was adopted in late 1944 but did not see war service.

.30cal M1919A6 An attempt to provide a light machine gun that was more effective than the tripod-mounted M1919A4. Issued to some units late in 1944, it could be fired from the shoulder, hip, prone from a bipod, or on the tripod.

2.36in M9 & M9A1 bazookas These began to replace the M1A1 in late 1944; they had improved range and reliability, and each broke down into two sections for carrying.

57mm T15E9 (M18) recoilless rifle Issued to the 17th Abn Div for the March 1945 Rhine jump; a few 75mm T21 recoilless rifles accompanied them. Both were ineffective against tanks, but useful against buildings and fortifications.

M4A3E2 "Jumbo" assault tank With a 105mm howitzer and heavier armor, this was the last model of the Sherman to be fielded during wartime. Not to be confused with the 105mm-armed M4 & M4A3 with standard armor.

105mm M37 self-propelled howitzer Adopted in January 1945 in only small numbers, replacing some 105mm M7 SP howitzers. It mounted the 105mm M4 gun from the assault Sherman on an M24 light tank chassis.

155mm M40 SP gun Mounted on a much-modified M4A3 tank chassis, this gun equipped one unit – 991st Fld Arty Bn.

M19 twin 40mm SP AAA gun Built on an M24 light tank chassis, as a replacement for the M15A1 combination AA halftrack (1x 37mm AA gun & twin .50cal HMGs), examples of this gun began arriving at the war's end but saw no combat.

M24 Chaffee light tank Armed with a 75mm gun, this began replacing M5A1 Stuarts, mostly in mechanized cavalry units, in January 1945; it saw significant action.

M26 Pershing heavy tank Armed with a 90mm gun, a few saw limited action in March–April 1945.

M39 armored utility vehicle A full-tracked personnel carrier and prime-mover for 3in AT guns, built on an M18 TD chassis with a 7-man open-topped compartment. Some were issued to towed TD battalions in the last months of the war.

Learning new tactics

It was not only equipment that changed. Tactically, even fundamental doctrines were subject to wide-ranging changes – and so rapidly that manuals quickly became outdated. For instance, experience in North Africa had exposed the deficiency of the doctrine for deploying tank destroyers; it took a year to rewrite the manual, so this was yet again obsolete when issued in July 1944. New equipments with capabilities improved far beyond those of what they replaced also rendered existing tactics and procedures obsolete. Units developed their own methods based on experience and conditions. Battalions in the same division and even companies in the same battalion might use different tactics, and also modified their internal organization and allocation of weapons and equipment as they felt necessary.

The US Army went to great lengths to pass on lessons learned to the troops, staffs, and commanders at all echelons. All units prepared after-action reports, not only for historical purposes but also to document tactical innovations and the use of weapons and equipment. The War Department's Military Intelligence Division distributed the *Intelligence Bulletin*, a monthly booklet aimed at the small-unit level, from August 1942 to September 1945. Another was *Tactical and Technical Trends*, issued twice a month to higher echelons from June 1942 to June 1945. Nine volumes of the booklet series *Combat Lessons, Rank and file in combat: What they are doing, How they do it* were issued by the War Dept's Operations Division during 1943–45. Divisions, corps, and armies also periodically distributed "lessons learned" reports.

B

THE NEW US ARMY M1943/44 FIELD UNIFORM

A new field uniform, developed in 1942–43 and combat-tested in Italy in March–April 1944, received high ratings. However, Gen Bradley of the European Command initially rejected it, owing to its appearance and because it provided less warmth than the wool overcoat. It was initially issued to the Airborne divisions in July 1944, and widespread distribution began in September and October, though many units did not receive it until 1945.

1: Rifleman, M1943 uniform, fall 1944

The main feature was the M1943 field jacket, an unlined, water- and windproof, thigh-length jacket with usefully large chest and skirt pockets. Baggy field trousers of the same material were provided (paratroopers often sewed on large cargo thigh-pockets, but these would not become standard until later). A pile liner was supposed to be provided with the field jacket, but seldom was. Under the uniform troops wore long underwear (50/50 cotton and wool), the olive drab (OD) flannel shirt and wool trousers, a wool sweater, and even the old Parsons jacket. (The "OD wool field jacket," based on the British battledress blouse and better known as the "Ike jacket," was originally intended to be worn under this uniform, but instead became a service jacket.) A detachable hood, pile cap with fur earflaps, and M1943 field cap were all available. Besides normal web gear for a rifleman, this soldier also has a three-pocket grenade carrier hooked to his belt on the right side and taped around his leg; this was first issued in late 1944. The M1944 combat boots, with a two-buckle flap, replaced the field shoes and inconvenient web leggings with their time-consuming laces.

1a: The detachable hood was big enough to be worn over the helmet, but in practice seldom was.

1b: The M1944 combat boot.

2: BAR gunner, snow-camouflage overwhites, winter 1944/45

Over his field uniform he wears the "overwhite" field parka and trousers made of thin cotton sheeting (some US units were alternatively issued British overwhites – see Plate E1). Leather-palm wool gloves were not as warm even as the separate leather gloves and inserts, but the new 12in-high M1944 shoepacs had improved design features and better waterproofing than the earlier version. This BAR-man is armed with his squad's .30cal M1918A2; the 2.5lb bipod was often removed to reduce weight, and the carrying handle was not available until late in the war. The M1937 BAR belt held 12x 20-rd magazines, but a limit of 8 was recommended to reduce weight. The assistant BAR-man carried two ammo-carrying bags (incorrectly called the "M1 bag"). This bag held ten BAR magazines, or four rifle bandoliers, a 250rd MG belt, numerous grenades, or many other ammunition items.

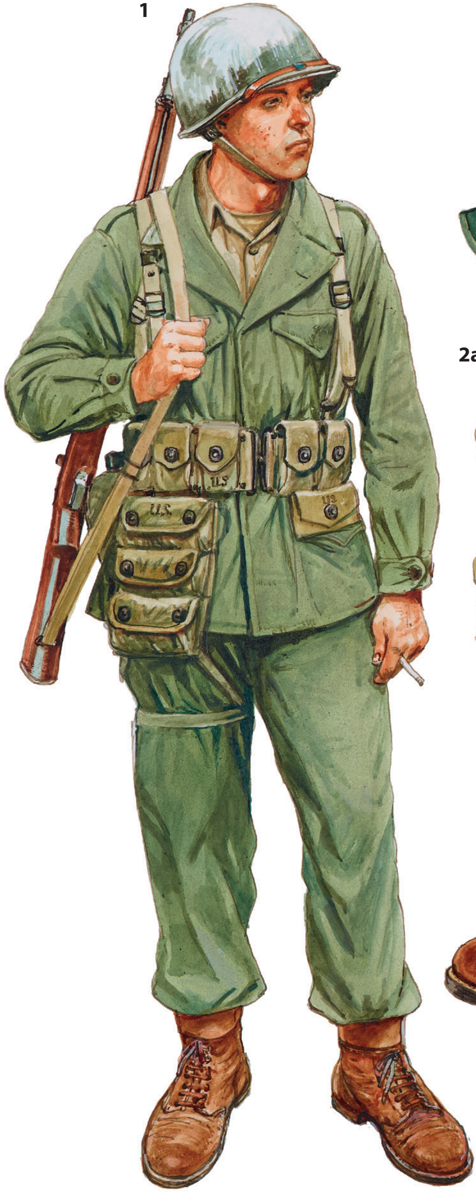
2a: The ammunition-carrying bag; this measures 12in high x 7.25in wide x 4.75in deep.

2b: The OD wool glove with leather palm-and-fingers insert.

3: Reversible ski parka

The reversible fur-trimmed ski parka, pale OD on one side and white on the other, saw limited issue, but was rushed to Europe to meet the need for snow-camouflage clothing. This is the second type, with fur trim at the hood only, buttoned wrist tabs, and buttoned diagonal flaps on the chest pockets. This man has wrapped a white cloth strip around the forepart of his Garand; care had to be taken that such camouflage did not hamper operation, loading, and sighting. He holds an M9 pyrotechnic projector (M5, prior to October 1942), as issued to platoon headquarters to launch 37mm colored signal flares.

3a: The M9 projector, with 37mm red and yellow/green flare cartridges.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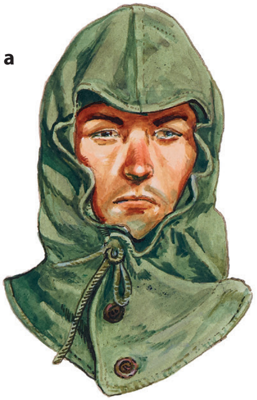
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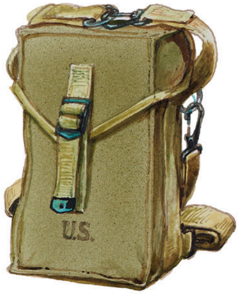
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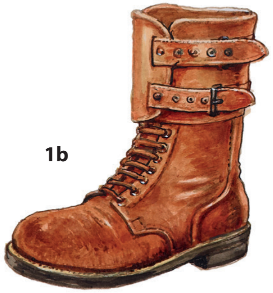
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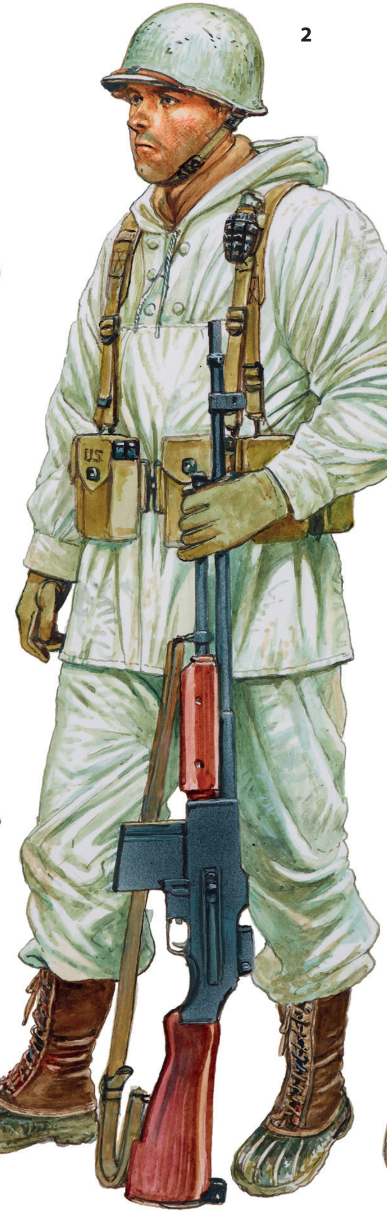
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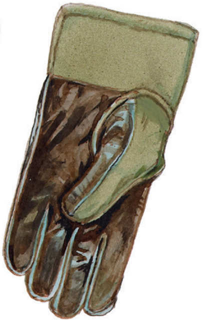
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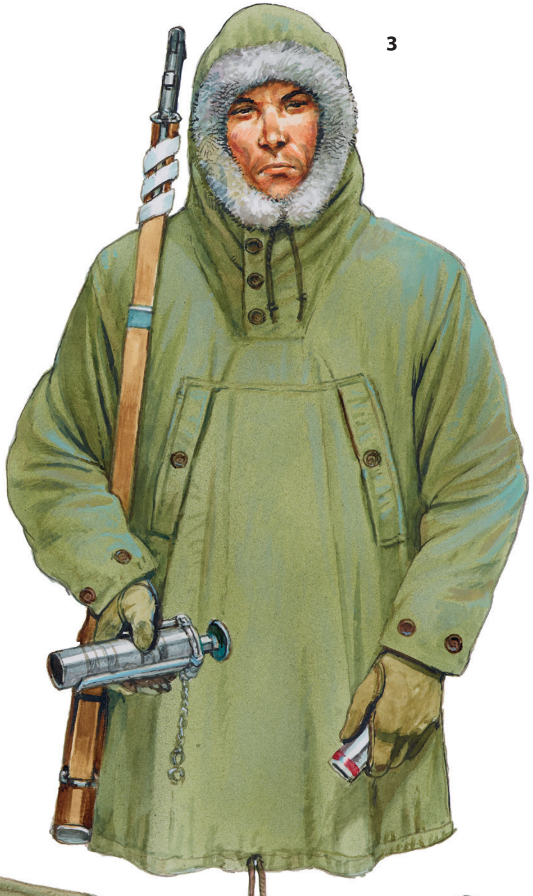
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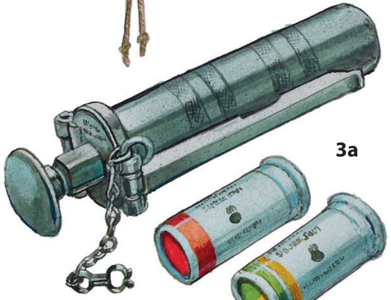
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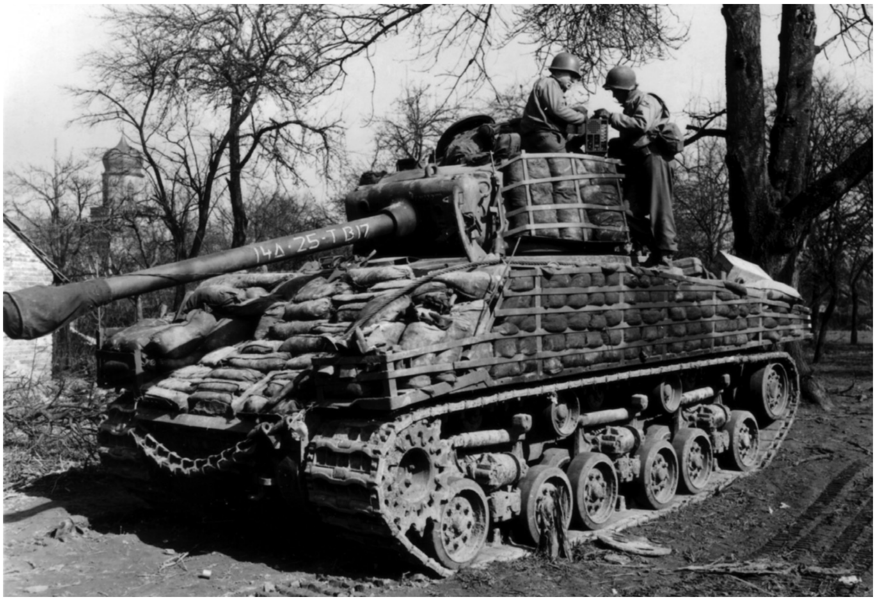
ARMOR/INFANTRY OPERATIONS

Apart from the crucial role of the artillery, the question of how to deploy tanks and infantry in the attack was perhaps the central challenge of war-fighting in NW Europe.

A consistent complaint was the lack, or insufficiency, of tank-infantry training for operating together. It was understood that this form of combat required detailed planning and coordination, especially for the separate tank battalions (i.e. those that might be attached to random infantry at short notice). Joint training was ordered in the USA in April 1943, but there were not enough tank battalions available, and when the infantry division deployed the tank unit they had trained with did not accompany them. Efforts were made to align tank battalions with divisions, but deployments and scheduling of other training and excises prevented this, both in the United States and in Great Britain. Another problem was the lack of firm doctrine or of battle experience, which led to unrealistic training scenarios. New manuals were published too late before the Normandy landings to enable new doctrine to be implemented, which would anyway prove inadequate – it was based on experience in Sicily and Italy, where the enemy had fielded fewer and older tanks and assault guns than those the troops would face in NW Europe.

Within armored divisions, tank and armored infantry battalions could be paired at every level: a tank company with an armored infantry company, a tank platoon with a rifle platoon, and individual tanks with rifle squads. The armored infantry used their halftracks to keep pace with the tanks, but when actually engaged the vulnerable halftracks remained in the rear, seldom even providing machine-gun support. (There were, of course, exceptions, when some units remained mounted until confronted with AT guns and Panzerfausts.)

An officer in the 752nd Tank Bn reported: "At certain times the burden of carrying the attack must, because of the terrain and situation, fall on the infantry. At other times, the tanks are best qualified to bear the brunt of the attack. Both units must ... learn to recognize the situations in which one or



A 76mm-gun M4A3E8 Sherman of 25th Tank Bn, 14th Armd Div early in 1945. Starting in July 1944, tank companies often had one 76mm-gun M4A1 or M4A3 in each platoon, but some companies concentrated all of them in a single platoon. The new turret was too heavy for the suspension, and the gun had no white phosphorus (WP) round; the M4A3E8 with improved suspension was not fielded until late December 1944. This "Easy 8" (possibly a postwar nickname) has been fitted by the divisional ordnance maintenance battalion with racks for sandbags; whether this gave adequate protection from the Panzerfaust and Panzerschreck was a matter of debate, but many tankers claim that it did. Such kits were approved in Seventh Army, and also fabricated in Ninth Army, but were not permitted in Patton's Third Army. Patton's reason for this was that even a dry sandbag averages 65lbs' weight, and when (as always) they became sodden with rain they added thousands of pounds extra, increasing fuel consumption and wearing out transmissions quicker. (Tom Laemlein/Armor Plate Press) the other unit should lead." The 191st Tank Bn recommended: "When working with infantry at night, the tanks should follow the infantry. The tank platoon leader or sergeant should advance on foot with the infantry." In this way the infantry could guide the tanks over favorable terrain, and protect them against ambushes. The tank leader walking with the infantry would guide the tanks in and designate targets.

Communication

Communication between infantry and tanks was essential, but extremely difficult in combat. Infantry and armor units used different radio frequencies, and engine noise prevented even simple voice communications between a tank commander in the turret cupola and the infantry leader on the ground. The most common method devised was to weld an empty ammunition can to the tank's rear plate to hold a field telephone, with a cable running inside the tank to another telephone. Some units tried dragging a lengthy cable behind the tank, with the infantry squad leader carrying a phone to be connected to the cable when necessary. Another method was to mount an SCR-536 "handie-talkie" inside the tank with the antenna protruding through a bolt hole, while the infantry platoon leader carried another (the AM "536" could not net with tank FM radios). From June 1944 an SCR-300 backpack "walkie-talkie" was fitted inside the turret to talk to the infantry, and late that year an AN/VRC-3 radio, a vehicle-mounted version of the "300," began to be installed in platoon leaders' tanks.

Intercommunication was naturally important when target-marking enemy positions for the tank to engage. In combat the enemy's deliberate camouflage of, say, a machine-gun nest was aided by smoke and dust. Colored-smoke hand and rifle grenades often generated too much smoke, actually obscuring the intended target, so soldiers sometimes removed part of the grenade's dye powder. Tracers and flares could also be used, but tracers were often difficult to see in daylight.

The SCR-300 "walkie-talkie" radio weighed 38lbs and had a range of only 3 miles; the bulky canvas case on this carbine-armed operator's left front is for antennas and accessories. In 1944–45 an infantry battalion had a "300" in each rifle company, the weapons company, and the battalion command post. It could not "net" (i.e., communicate) with the AM SCR-536 "handie-talkie" used between platoons within a company and between platoons and the command post. (For further details, see Elite 181, *World War II Battlefield Communications.*) (Tom Laemlein/Armor Plate Press)

Tank-riding

It was common practice for infantrymen to ride aboard tanks. When the tank halted, two infantrymen often stayed on it to man the turret-top machine gun while the rest fanned out for security. Infantrymen accompanying tanks searched for mines, protected tanks from close-in Panzerfaust attacks, cleared ambush sites and buildings, and guided tanks around obstacles. A full squad (or even two) could pile aboard a Sherman if imminent contact was not probable, but if engagement was expected it was advisable for no more than six men to ride it, to ensure rapid dismounting if taken under fire. The riding infantry, high up and with unrestricted visibility, were invaluable for spotting threats and obstacles, but they had to stay clear of the tank's armament, being prepared for the turret to rotate without warning.

The location of dismounted troops in relation to tanks depended on the situation and conditions. They might cluster close behind a tank for cover; spread out to the flanks in close terrain, to protect against enemy tank-killer teams; walk close behind in the tread marks to enable them to avoid antipersonnel mines, or at varied distances to avoid enemy fire directed at the tanks (including ricochets). Tanks following infantry had to take care to avoid hitting them with machine-gun fire. Tanks would "shoot" the infantry onto their objectives, but then often withdrew to rearm and refuel – and because tanks remaining on the seized objective drew enemy artillery fire.

Tankers learned to keep a white phosphorous (WP) smoke/incendiary round loaded in their gun. When engaged by a Panzer, "SP" gun or antitank gun, they immediately fired WP to blind the enemy; German crews might then withdraw from this vulnerable situation. High-explosive (HE) rounds were essential, as tanks were often called on to engage field fortifications, enemy-defended buildings, and troops in the open. Allied armored units had mostly 75mm-gun tanks, but also a minority armed with more powerful high-velocity 76mm guns. For enhanced infantry-support capability the US Army relied on the "Jumbo" M4 and M4A3 assault Shermans with 105mm howitzers, allocated one per tank company and three in the battalion HQ company's assault-gun platoon (again, some units concentrated all of them in that platoon).

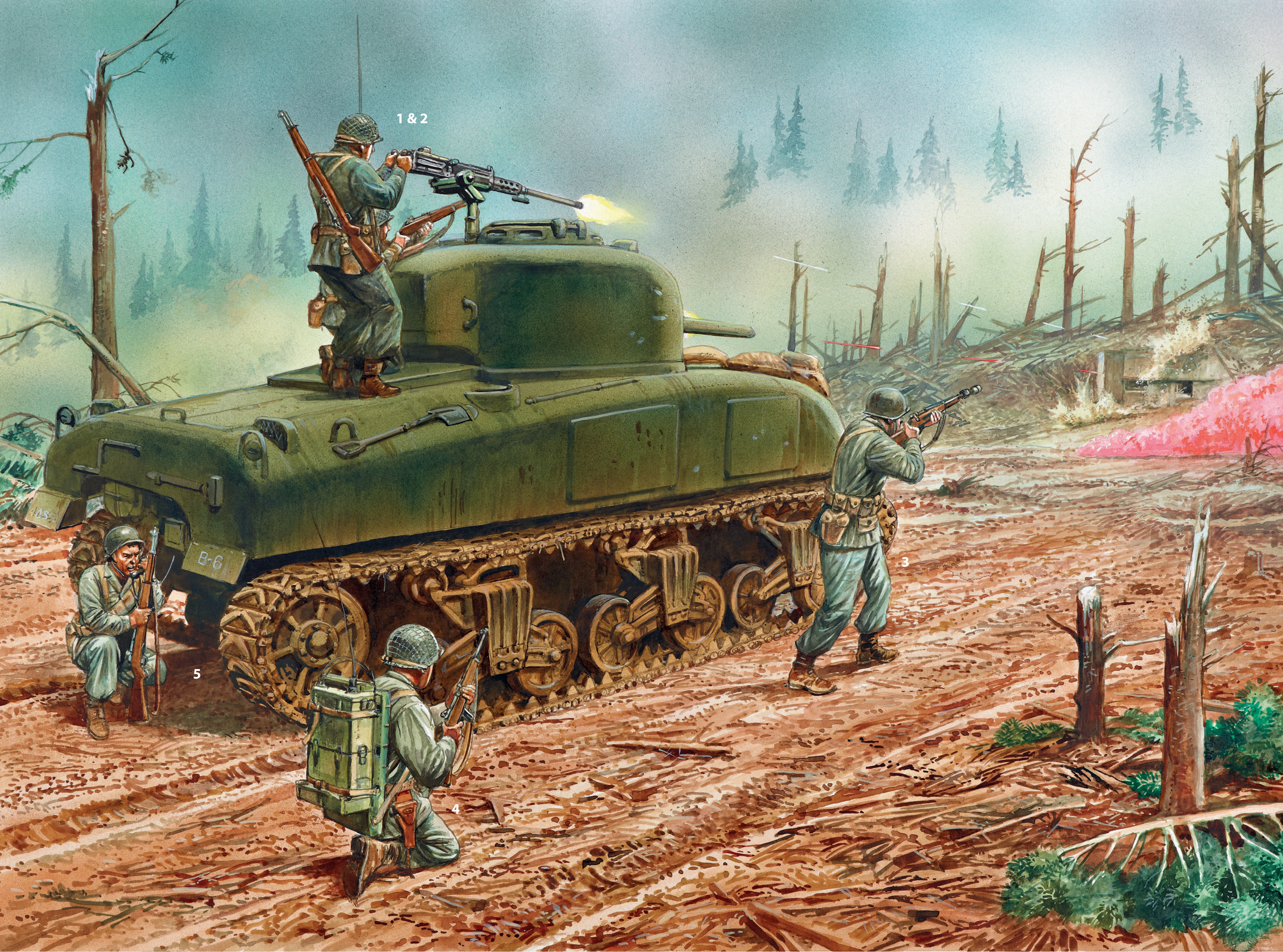
The tank battalion's light company, with M5A1 Stuarts, performed multiple roles: recon and security for the battalion or attached to the divisional recon troop, providing flank security and reinforcing infantry. While more vulnerable, the Stuarts could better negotiate denser woodland and muddier fields than the Shermans, which were forced to stay on roads through such terrain. German 7.5cm and 7.62cm AT guns, as well as SP assault guns, were well dug in and camouflaged to cover roads, and the lead Sherman was almost certain to be knocked out. Infantrymen with Panzerfaust and Panzerschreck man-portable weapons would lie in wait to engage at close range, and mines also took a great toll. When a tank was set on fire the most devastating damage was not the result of exploding fuel tanks, but from the explosion of stored shells. Improvements to the Sherman were continuous, and one of the most important, fielded from September 1944, was the installation of "wet storage" for the ammunition – protective chambers with a water barrier. Some 60–80 percent of standard Shermans penetrated by AP

C

US ARMY TANK-INFANTRY TEAM, 1945

Units developed their own techniques for tank-riding infantry; there were no standard guidelines until very late in the war, and even then most units continued their own practices. When there was little chance of engagement up to 24 men could pile on a tank, but in combat it was no more than 8–10, to ensure quick dismounting if taken under fire. Even when dismounted, many units kept two men aboard the tank, with one manning the .50cal M2 for suppression and recon-by-fire **(1 & 2)**. A man standing on a tank deck about 10ft above the ground had a greater field of vision, and some units kept a BAR man and a rifleman on the tank for close-in protection. In some units, four antipersonnel mines were carried on each tank for the infantry to plant when going into the defense. Walking infantrymen naturally used tanks for cover, though their proximity varied greatly; some walked in the tanks' tread marks to avoid antipersonnel mines and small arms fire, and in freezing weather the heat from the exhaust close behind the tank was welcome. When the enemy tried to separate the infantry from the tanks by mortar and artillery fire the infantry might drop 50–100 yards to the rear. There were instances, especially at night, when infantry advanced ahead of tanks to knock out AT guns and Panzerfaust teams.

Communication between the tank commander and the accompanying infantry was critical, but difficult. Verbal communications were impossible owing to overwhelming engine and track noise, the racket of battle, and simply because tankers wore M1938 tanker helmets with muffling radio/intercom earphones. A British infantry platoon commander, Lt Sydney Jary, recalled that in Normandy he risked climbing onto Shermans to point out targets, but he and the tank commander could barely hear one another even when the tanker handed him an intercom headset. The tank crew's restricted visibility, especially close up, made it almost impossible for them to see infantry hand signals. For marking targets for the tank, WP smoke and colored-smoke rifle grenades (red, yellow, green, or violet) were effective **(3)**; rifle-launched colored signal flares (red, amber, green, or white) were used at night, but could dazzle tankers' night vision. Tracers were often difficult to detect in daylight, especially in smoke and dust. Tankers, infantrymen, and artillerymen used radios set in different frequency ranges, but during 1944 infantry-compatible radios began to be installed in platoon leaders' tanks. The backpacked SCR-300 "walkie-talkie" shown here **(4)** could communicate with the tank's new AN/VRC-3 or a loaned "300" inside the turret. An effective method was to weld an ammunition can on the tank's rear, holding either an EE-8 field telephone or TS-10 sound-powered telephone that was connected to a phone in the turret **(5)**. It was wiser for the infantryman to carry the handset outside the span of the tank's tracks, in case it lurched backward when braking, or suddenly reversed.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rounds burned, but only 10–15 percent of those with wet storage.

Tank battalion employment

Medium tank battalions had an HQ company (3x 75mm M4, 3x 105mm M4); three medium tank companies (initially, 17x 75mm M4 – later substituting up to 6x 76mm – plus 1x 105mm M4); and a light company (17x 37mm M5A1). All battalions – whether one of the three assigned to an armored division, or a separate battalion attached to an infantry division – were organized the same.

The crew of a 3in-gun M10 tank destroyer of 823rd TD Bn in Belgium, 1945. Most wear the padded, windproof, water-repellent winter combat jacket (aka "tanker's jacket") and bib-front trousers. As here, TD crews often preferred the M1 steel "pot" rather than the rubberized fiber and leather tanker's helmet. Note that they have also armed themselves with M1 rifles, more effective for close-in defense than the issued M1 carbines. (Tom Laemlein/Armor Plate Press)

In North Africa, detaching tank battalions from the overstretched 1st Armd Div to support infantry divisions diluted the division's ability to mass armor. This experience clarified the need for separate tank battalions to support the infantry. The US had rejected the British concept of higher-speed "cruiser tanks" in armored divisions to combat enemy tanks, and slower-moving, more heavily armored "infantry tanks" in separate tank brigades to support infantry. American tanks, however allocated, were supposed to break through enemy lines, allowing the infantry to follow through. From 1943, more specific training for this role began to be given to separate tank battalions, while it was intended that tank destroyers would combat enemy tanks. However, what was encountered in France bore little resemblance to armored warfare in North Africa, Sicily, and Italy.

Armored divisions possessed three each tank, armored infantry, and armored field artillery battalions. These were organized in two so-called Combat Commands (CC) – regimental-level forces designated as CCA and CCB – plus a Reserve Command (RC). Each CC usually had one each tank, armored infantry, and armored field artillery battalions, plus recon and engineer companies, and perhaps a TD company. It was not uncommon for an infantry regiment to be detached from an adjacent or reserve infantry division to increase the infantry strength, especially when operating in forested or broken ground or urban areas. The RC was a small headquarters to which battalions were rotated to refit while acting as the division reserve. Some divisions split all their armored infantry and tank battalions between two task forces (aka "teams"). Others (the 5th, 8th, 9th, & 13th Armd Divs) strengthened the RC HQ, sometimes using an armored group's HQ, and employed it as a third combat command – "CCR" – to be committed like CCA and CCB.

The described organization was for "light" armored divisions. The 2nd and 3rd Armd Divisions, in First and Ninth armies respectively, retained the previous 1942 organization as "heavy" divisions. Their tank strength was organized into two regiments, each with one light and two medium tank battalions, of three companies apiece. They too possessed an armored infantry regiment with three battalions, but showed slight differences in support-unit organization.

Another mission for tanks and TDs was to augment field artillery. Such units had to undertake special training, integrate in the artillery communications system, and occupy prepared and surveyed positions. It was found that if tanks parked with their long axis sideways to the target they provided a more stable firing platform. Sometimes earth ramps were bulldozed to increase elevation for longer range.

ANTITANK WARFARE

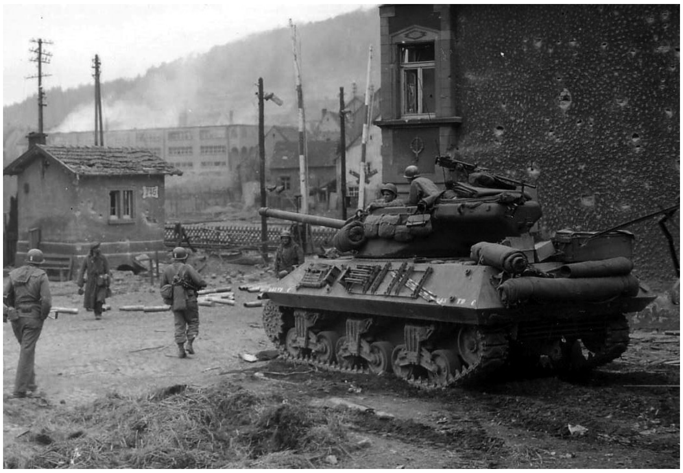
Tank destroyers

Tank destroyer battalions had been envisioned as offensive units rather than defensive: held in reserve, they were to rush to sectors where German armor was attacking and engage by fire and maneuver, aggressive action being strongly encouraged. However, faith in the TD concept began to diminish in late 1942 in North Africa; the 37mm and 75mm guns were found to be inadequate, and the halftrack-mounted SP units had poor cross-country mobility and ineffective armor. Of the original 220 TD battalions planned in 1941, eventually only 106 were raised, of which only 61 deployed to Europe. In November 1943 it was decreed that half the TD battalions would be self-propelled and half towed.

Self-propelled TDs were to move up to a threatened sector and engage attacking Panzers from temporary firing positions, repositioning as necessary – in effect, to ambush. They were not intended to fire and maneuver continuously like tank units. Self-propelled TD battalions had three companies; each had three platoons and 12 TDs, plus a jeep and two M20 utility cars for commanders. Typically, companies were broken down into independent platoons for combat. The battalion also possessed a three-platoon recon company with two M8 armored cars and five jeeps per platoon, plus a pioneer platoon for mine-laying and obstacle construction.

Towed TD battalions had three companies each of 12x 3in M5 AT guns towed by M3A1 halftracks, and two recon platoons in the HQ company. The towed battalions proved almost worthless, owing to the great size and weight of the 3in AT gun. Like its British counterpart, the 17-pdr, it was too large to manhandle from one position to another, required hours to dig in, was difficult to camouflage, and thus vulnerable to mortars. Once a unit dug in it was essentially immobile, and when engaged by Panzers they were frequently overrun.

For the Normandy landings self-propelled TD battalions were equipped with the M10, equipped with a less than effective 3in gun on a modified Sherman chassis. In the United States, the M18 was in production with a somewhat improved 76mm gun mounted on a lighter, high-speed chassis, but it was rejected by the European command. The gun was only marginally better, and if it were introduced to in-theater TD units with the M10 they would have to retrain mechanics and take on separate stocks of spare parts. The heavy M36, with a 90mm gun on an M10A1 chassis, was also in production. Tank destroyer units still in the United States were equipped with the M18 and M36; these began to arrive in France in August 1944, and M10-equipped battalions in-theater received enough M36s to replace a company at a time.



Passing a German house that appears to be pocked by .50cal fire, a 90mm-gun M36, the most commonly used TD in Europe, moves through a town in support of infantry. The crew's bedrolls and musette bags are slung outside the turret; the red-and-white striped poles stuck under a hull-side rack are aiming stakes, for use when the TD is employed for indirect fire support to "thicken up" field artillery. By the war's end most TD battalions in Europe were equipped with M36s, a small number with M18s, and a very few retained M10A1s. The surplus M10s had been passed on to the dismally performing towed AT battalions, so only a handful of towed units remained. (Tom Laemlein/ Armor Plate Press)

The self-propelled TDs' major flaw was that they "looked like" tanks, giving the impression of being more formidable than they actually were. Their armor was much lighter than for tanks; they relied on speed for protection, which failed to compensate for their thinner armor when slugging it out with Panzers and assault guns. Their turrets had open tops, making them vulnerable to airbursts, mortars, and grenades. They also lacked a key weapon that made tanks valuable offensive weapons: coaxial and bow machine guns (though they did mount a turret-top .50cal MG).

In practice, a self-propelled TD battalion was attached to an infantry or armored division for a variety of missions: AT defense, infantry fire support, indirect fire support, harassing and interdiction fires, and flank security. Tank destroyer battalions attached to a division would typically detail one company to each of its regiments, with platoons attached to infantry battalions, and sometimes even a section (two TDs) to rifle companies. A frequent complaint was that they sometimes withdrew quickly when Panzers appeared. Possessing light armor, they were less suited than tanks for assaulting fortifications and dug-in AT guns. It was found that when fighting without infantry support, units lost three TDs for every Panzer they knocked out. The doctrine – that tanks were to penetrate through enemy defenses, and leave the tank-fighting to TDs – was simply unworkable, and the production of TDs was a serious waste of resources that would have been better used for the production of more tanks and the fielding of more separate tank battalions.

Infantry antitank

In March 1943 the 57mm M1 AT gun, licensed from the British 6-pdr Mk II, began replacing the ineffectual 37mm M3A1. The 57mm was authorized in infantry battalion HQ companies (a platoon of 3 guns) and the regimental AT company (9 guns), towed by 1½ -ton cargo trucks. Each rifle company of an armored infantry battalion had a platoon of 3x 57mm AT guns towed by halftracks. The 57mm could knock out Panzers with flank and rear shots, but there were few opportunities to gain this advantage. Instead, they were sometimes used to outpost roads on the flanks, and as fire support against buildings and fortifications, using HE rounds (though these had only a small charge, and also wore out barrels quickly). Each 57mm AT gun crew also had a bazooka.

The 2.36in M1 and M1A1 bazookas were the infantryman's principal AT weapon. The improved M9 and M9A1 versions began to be issued in late 1944 and were in widespread use by January 1945 (although M1A1s were still issued to service and support units). A rifle company had 5 bazookas, the weapons company 6, and the HQ company 7. Most divisional combat support, service, and HQ units had bazookas for tank self-defense. Each of an armored rifle platoon's five halftracks carried a bazooka. Infantry battalions lacked dedicated crews for their bazookas; in rifle companies they were issued to platoons as needed, to be manned by trained-up riflemen, and many companies formed three or four two-man bazooka teams. The lightweight bazooka made it possible for infantrymen to stalk Panzers so as to attack their vulnerable sides and rear, and also proved useful against pillboxes and defended buildings.

River crossings

The ability to keep tanks and TDs up with the infantry despite the many rivers and other water obstacles encountered during the advance into and across Germany was due not only to the Engineers' remarkable bridging

US field artillery battalion equipment

Weapon	*Pieces per battalion*	*Total*
75mm M1A1 pack howitzer (parachute)	3x 4-howitzer batteries	12
75mm M1A1 or 105mm M3 howitzer (glider)	2x 6-howitzer batteries	12
105mm M2A2 towed howitzer	3x 4-howitzer batteries	12
105mm M7 or M37 SP howitzer[1]	3x 6-howitzer batteries	18
4.5in M1 towed gun	3x 4-gun batteries	12
155mm M1 towed howitzer	3x 4-howitzer batteries	12
155mm M1A1 towed or M12 SP gun	3x 4-gun batteries	12
8in M1 towed howitzer	3x 4-howitzer batteries	12
8in M1 towed gun	3x 2-gun batteries	6
240mm M1 towed gun	3x 2-howitzer batteries	6

Note:
(1) In armored field artillery battalions, either separate, or assigned to armored divisions.

resources and capabilities, but also to an "inland navy."[3]

No complete US amphibian tractor battalions served in Europe until they were converted from existing units after VE-Day, destined for Japan. However, the light companies of a few tank battalions were converted to amtracks for the Rhine crossing, using the Alligator LVT(4). The Army used the DUKW-353 or "Duck," a 2½ -ton , 6-wheel truck capable of carrying 2½ tons of cargo, a 105mm howitzer, 25 troops, or 12 litters. Transportation Corps amphibian truck companies had 50 Ducks, and several companies were assigned to each army; they could load up under cover, drive to and across a river, then drive on to a safe unloading point.

US Navy Units Nos. One, Two, and Three were attached to the First, Third, and Ninth US armies, respectively. Each was equipped with a couple of dozen 36ft LCVPs (landing craft, vehicle & personnel) and 50ft LCM Mk IIIs (landing craft, mechanized), of which the latter could carry a tank. After crossing to France under their own power they might follow rivers and canals, or be hauled overland using (for the LCVP) a 10-ton semitrailer drawn by a 2½ -ton truck-tractor, and (for the LCM) the M26 Dragon Wagon tractor drawing a 40-ton M15 tank transporter semitrailer. These units were augmented by a small number of US Navy Construction Battalions (Seabees). An example of the capabilities and value of the US Navy units was XII Corps' Rhine crossing near Oppenheim on March 22, 1945 assisted by Navy Unit No. Two. In 72 hours the "inland sailors" lifted more than 15,000 troops and 2,000 vehicles, and also conducted security patrols to protect bridges.

FIELD ARTILLERY

Infantry "division artillery" consisted of one 155mm howitzer battalion and three of 105mm howitzers. Armored divisions had three armored field artillery battalions with 105mm M7 SP howitzers, and usually had a 155mm towed-howitzer battalion attached. In addition to 215 divisional artillery battalions in Europe, there were 238 separate battalions attached to groups under higher echelons of command.

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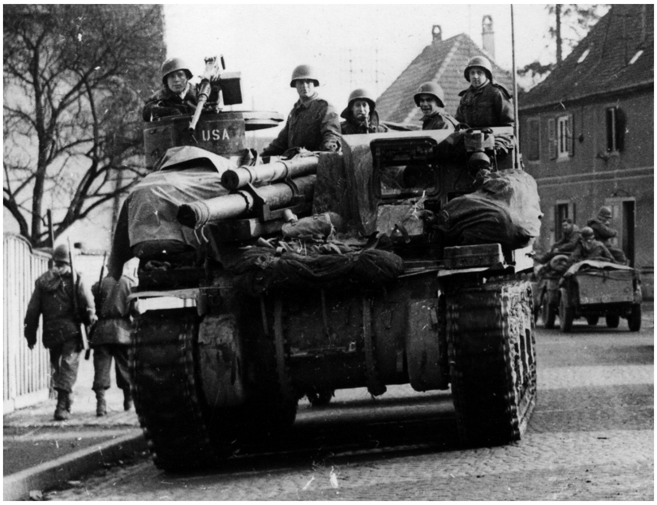
[3] See also Elite 195, *World War II River Assault Tactics*

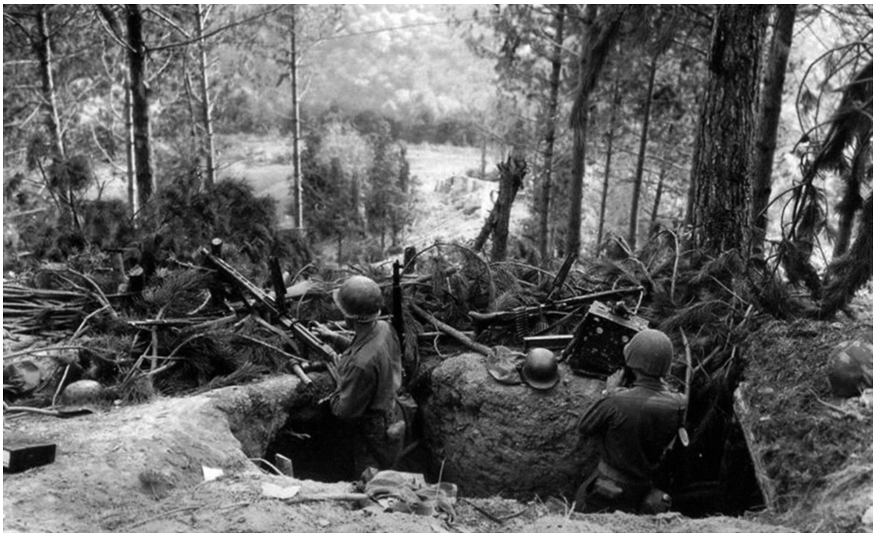


The 105mm M7 howitzer motor carriage (called the "Priest" by the British) equipped armored field artillery battalions assigned to US armored divisions; separate battalions under corps command were also attached, as needed, to armored and infantry divisions. Although the M7s were open-topped and had only light armor, they were also occasionally employed as "assault guns" for direct fire support. This M7 was photographed in Hagenau, France, early in 1945. (Tom Laemlein/Armor Plate Press)

American artillery was extremely responsive and flexible, with rates of fire so high that the Germans referred to it as "*automatische Artillerie*." Officers of all combat arms were taught to call for artillery fires, needing only a radio or field telephone to do so, and there were instances when enlisted men were "talked through" a fire request. Only divisional 105mm battalions had forward observers (FOs), one assigned to the battalion HQ and one to each battery; there were also three liaison officers in the HQ, for attachment to infantry regiments.

Artillery battalions in direct support of infantry regiments and battalions would detail FOs and liaison officers to them. These were also able to request and coordinate fire by other artillery battalions supporting the division, whether divisional or corps artillery. Most fire missions were preplanned to support specific phases of operations, but the 105mm battalions were readily on call, and if reinforcing fires were necessary additional corps battalions could be brought into play. Infantry-regiment cannon companies were often incorporated into the divisional artillery system, even though they were intended for direct fire.

The communications net was so effective that fire could be delivered in 5–7 minutes from the FO's fire request, to include calculations at the fire direction center, and laying the guns. When emergency fire missions were requested, such as during an enemy counterattack, batteries without current missions would monitor the fire-control net and plot a mission on their own. German commanders, expecting to have up to 20 minutes free of artillery fire when launching attacks, were surprised to be caught by barrages within minutes. The fire direction center could calculate the firing data for any number of batteries and battalions for a target that only one FO could see.



US infantrymen examine an abandoned German machine-gun/observation position, complete with two MG42s and a battered Torn.Fu.d2 radio. Note the entrances to dugouts at each side, offering some protection from US artillery tree-bursts and proximity-fused shells. This position was probably detected easily, given away by the cleared field of fire down the ridge finger, and by the piled fir branches, which would be conspicuous when seen from the front. (Tom Laemlein/Armor Plate Press)

The “magic” fuse

The development of the proximity or “variable-time” (VT) fuse was a secret guarded almost as closely as the date and location of the Normandy landings. The fuse contained, in effect, a rugged miniature radio transmitter/receiver, which transmitted radio waves that were reflected back to the receiver. When the return timing matched a preselected distance-from-target, the projectile detonated: for example, 105mm and 155mm howitzer rounds exploded about 30ft overhead. Such “airbursts” are particularly devastating, showering fragments into open-topped positions and over a much wider casualty radius than rounds impacting on the ground. (Previously, airbursts had been accomplished by setting mechanical time-fuses – a very time-consuming and relatively imprecise process.)

The new fuses were available from early 1943, but such importance was given to preventing the enemy from recovering dud VT-fused rounds that initially they could only be fired at enemy aircraft flying over water; it was estimated that the enemy would need six months to reverse-engineer and produce their own VT fuses. In summer 1944 they were used to down a large percentage of the V1 “buzz bombs” approaching the English coast, and when V1s were shifted to attack Antwerp the use of VT fuses was authorized, on October 25, for 90mm AA guns on land. The fuses were finally supplied to field artillery in December 1944 – but without authority to employ them. On the first day of the Ardennes onslaught the CO of the 406th Fld Arty Grp allowed the first rounds to be fired regardless of orders; they proved highly effective, and Gen Eisenhower released them for general use three days later. For US field artillery, VT fuses would be available for 75mm howitzer, 105mm howitzer, 4.5in gun, 155mm howitzer and gun, 8in howitzer and gun, and 240mm howitzer rounds. They were also supplied for the British and Canadian 25-pdr, 4.5in, and 5.5in guns.

REPLACEMENTS & SHORTAGES

Personnel

The US Army developed a reasonably effective personnel replacement system, but, like any system so massive and physically widespread, it had its weaknesses.

When raised, previously non-existent divisions received a cadre of experienced officers and NCOs, officers fresh out of Officer Candidate School (OCS), and trained technicians and specialists. The cadres were drawn from an existing division, which in turn had to promote and train from within to fill the several hundred vacancies thus caused, and then fill and train those new vacancies from additional recruits and OCS graduates provided as fillers. At the same time, divisions were directed to provide numbers of officers and men – usually in the hundreds – for specialist training, to fill non-divisional units such as TD or MP

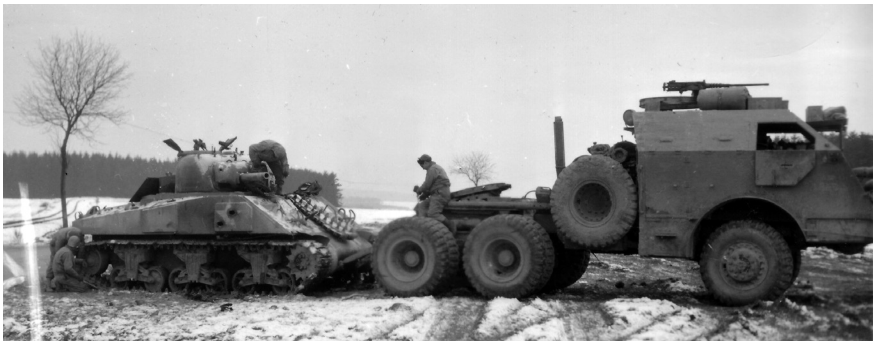
BAR team in the Ardennes, winter 1944/45. The rifleman at left has an M7 grenade launcher fitted to his M1, as issued three per squad and one in the platoon HQ. With the launcher fitted the semiautomatic Garand rifle had to be hand-cocked after each shot. During the continuing process of reinforcement of the US armies in NW Europe, deployments did not always match pre-deployment training. An extreme example was the 71st Inf Div, which had been extensively trained in California and Panama for Pacific jungle warfare; when the “Battle of the Bulge” broke out, the division’s scheduled deployment was canceled and it was rushed to fight in the harsh European winter, arriving in February 1945. (Tom Laemlein/Armor Plate Press) battalions, to provide qualified men for OCS, as paratrooper volunteers, or (latterly) as urgent replacements for overseas combat casualties. In a matter of weeks a division that had been well on its way to becoming fully manned and trained lost a few thousand trained men, and received a like number of untrained or partly trained troops – and it might suffer this process two or three times over. At the last moment before deployment the final vacancies had to be filled with men who had received, at best, 17 weeks' basic and infantry training, or only 4–6 weeks of basic, or who had been culled from AAA, TD, and other surplus units. These men were not adequately trained either individually or collectively, and were unfamiliar with their leaders.

Those "11th hour fillers" were, however, much more fortunate than individual replacements assigned to a unit while it was in combat. Most were sent overseas from replacement depots after 17 weeks of basic and infantry training, which was often rushed and occasionally cut short. There were instances of men trained for other assignments having to learn "on-the-job" after finding themselves unexpectedly posted to infantry or tank units. Surplus units which were broken up to provide replacements, usually in Great Britain, were often untrained or had undergone a thrown-together 6-week infantry course. (The number of AAA battalions was reduced from an originally planned 800 to 460 in 1944, and about 100 existing battalions were inactivated.)

Even the infantry occasionally got a few days' rest, like this 94th Inf Div soldier warming himself in a well-appointed winter bunker. Note his black cloth-topped arctic overshoes, and "liberated" items including a Dietz kerosene railroad lantern and a couple of bottles of local beer.
The best time to introduce replacements into a unit was when it was pulled back into regiment or division reserve. Holding replacements back until their unit came out of the line allowed them to acclimatize, ensured they had the necessary gear and sometimes a briefing on the unit's situation, and gave an opportunity to introduce them to the CO and NCOs in their chain of command. Their squad might even make more of an effort to integrate the newcomers whilst it was in the rear, though it was difficult to motivate exhausted units to undertake the tactical training necessary to accomplish this. (Tom Laemlein/Armor Plate Press)

Shipped to France, replacements were shuffled from camp to camp to await assignment. In theory, physically disabled infantry veterans were supposed to provide additional training, but they were given little guidance and few facilities. Assigned to a division, replacements were processed and parceled out to regiments, but limited time prevented any effective unit orientation. Groups of replacements were broken down into battalion allocations and then dispersed to companies. They often arrived with the evening rations and ammunition supply, and were delivered to their platoons carrying them. They might be divided up equally between platoons and assigned to squads, but often particular platoons had suffered disproportionate losses. Replacements were disoriented, did not know anyone in the chain of command, and found themselves among veterans whom they held in awe. To the veterans, who may themselves have been replacements just weeks or even days previously, replacements were a hindrance even if the platoon was undermanned; their inexperience made them dangerous not only to themselves but to the veterans. Knowing that perhaps three out of every four of the replacements would become casualties within two weeks, many veterans did not ask their names, and even avoided them: it seemed pointless to offer them advice. This did nothing to improve morale and unit cohesion.

Unless platoons were drastically understrength, some units temporarily held replacements in the regiment or battalion rear. (Standard rifle platoons theoretically had 41 men, and armored rifle platoons 56, but in practice it was common for a platoon's line strength to be around 20, organized into two squads instead of three.) As battalions were rotated into regimental reserve they were allotted their replacements (ideally this might occur when the whole regiment was placed in division reserve, but that was less frequent).



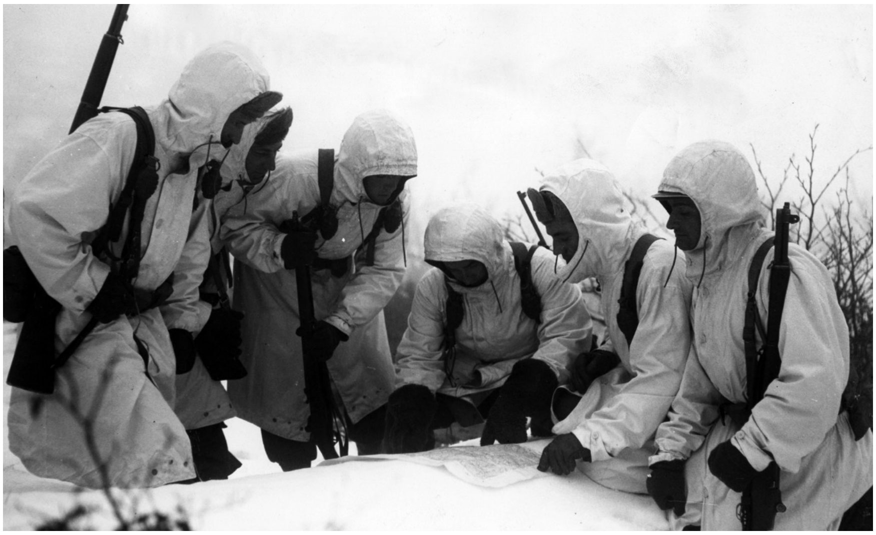
The recovery of crippled tanks was critical, since most could be repaired or at least cannibalized for parts, which were often in short supply. When left in control of the field after a battle (as was usual in 1945), the Allied armies enjoyed advantages over the Germans both in their tank-recovery equipment and in the relative safety afforded by Allied air superiority. This 4th Armd Div Sherman near Bastogne, Belgium in January 1945 is being recovered by an M26 armored tractor-truck, usually accompanied by a 45-ton M15 semitrailer. The tank appears to have taken two 7.5cm hits through the forward add-on armor plate intended to protect the ammunition storage bin; the painted white star seems to have provided an aiming point. (Tom Laemlein/Armor Plate Press)

Junior officer replacements had an even tougher time than enlisted men. They emerged from OCS highly motivated and desirous of proving themselves, but as inexperienced as any other replacements. Because of their exposure as leaders – constantly on the move between company command posts and their squads – they did not last long; it was common for 6-officer companies to go through 10–20 officers in a month.

Wounded soldiers who recovered in-theater were normally returned to their regiment and, if at all possible, to their company, but might not return to the same platoon. Many of the wounded were overly cautious or not fully healed, thus limiting their abilities and stamina. Combat exhaustion also took a heavy toll. Most such cases recovered, to a degree (and only temporarily), after 3–5 days in rest camps, where they were often heavily sedated to help them sleep, and given showers, fresh clothes, and hot meals.

Tanks

The allocation of replacement tanks to battalions depended more on availability than any preferred mix of models. Typically, two-thirds of a company's 18 medium tanks were 75mm-gun M4, M4A1, and M4A3 Shermans, while the rest were 76mm-gun M4A1s, M4A3s, and M4A3E8s. The allocation of 76mm-gun Shermans was uneven: 3rd Armd Div possessed fewer than 50 out of 200 tanks, while 9th Armd Div had 100 percent 76mm-gun tanks. Even units which wound up with mostly 76mm-gun tanks usually retained at least one 75mm-gun



A recon patrol study their route before a mission in the French Alps, 1945; they have been fortunate in being issued with full overwhite clothing (see Plate B2) and insulated pile caps. One of the most notorious failures of supply was the fact that after three years of war the US Army's winter clothing was still inadequate in the winter of 1944/45, one of the coldest and wettest on record. The snow-camouflage parkas were designed to be worn over web gear, but in practice men often wore their webbing on top: this allowed easy access to ammunition, and helped break up a soldier's outline when in snowy woodland. (Tom Laemlein/Armor Plate Press)

Sherman per platoon for firing WP smoke rounds, which were not available for the 76mm.

Owing to much higher than forecast losses there was a tank shortage in October 1944, and battalions were authorized 4–6 fewer tanks. This was soon rectified, but was followed by a spare-engine shortage that slowed the return of damaged tanks to units. The improved and more "survivable" M4A3E8 first appeared on New Year's Eve, 1944. Small numbers of 90mm-gun M26 heavy tanks were assigned to the 2nd, 3rd, and 5th Armd Divs in March and April 1945, but had little impact, as there were few Panzers left to shoot at. Self-propelled assault guns *(Sturmgeschützen)* and tank hunters *(Jadgpanzer)* without rotating turrets were now the most common AFVs encountered.

Troops of 94th Inf Div at Sinz, Germany, draw ammunition and rations dumped from vehicles at a company supply point; the smaller black tubes on the crate hold rifle grenades. The nearest rifleman is inserting two K-ration meals into his empty M1943 entrenching-tool carrier; units were ordered to carry three days'-worth of C- and K-rations for emergencies. Company field kitchens were able to operate closer to the frontline than expected, but there were many difficulties in serving the troops hot breakfasts and suppers. These included getting the fresh rations to the company kitchens, preparing meals in the dark, units advancing or repositioning, enemy ground and artillery attacks, and rain – and if the temperature dropped below freezing, everything took longer. Cooked food then had to be man-carried to the positions, if they could even be found. If no chow arrived the troops consumed their emergency rations, and then, hours late, a carrying party with cold, congealed food *might* show up. It was then simply dumped – cumulatively, a massive waste of money and effort. (Tom Laemlein/Armor Plate Press)

Supplies

There were periodic shortages, of which the most famous occurred in September 1944. Fuel priority went to the 21st Army Group to support Op "Market-Garden," and sufficient fuel could not be brought in until the river approaches to Antwerp were secured. The result was that Patton's Third Army stalled after the late-September battle of Arracourt (his tanks did not literally run out of fuel on the road; enough was in hand for defensive maneuvering). There were also occasional ammunition shortages, especially for artillery and mortars; a major example of this occurred in December 1944 owing to the German Ardennes offensive. Most ammunition shortages were short-term and localized while priority went to other corps or armies, rather than being suffered across the board, but artillery and mortar WP rounds were frequently scarce owing to higher-than-forecast expenditure. Other shortages included medical supplies (especially plasma), motor oil, and winter clothing.

BREACHING THE SIEGFRIED LINE

The much-vaunted "Siegfried Line" (more correctly, the *Westwall*) stretched for more than 390 miles on Germany's western frontiers facing the Netherlands, Belgium, Luxemburg, and France. Built during 1938–40 from Kleve on the Dutch frontier to Lorrach near Basle on the Swiss border, most of the defenses were well west of the Rhine, but in the south that river formed the French-German border and the defenses were on the east bank. In the summer of 1940 it was effectively abandoned owing to Germany's conquest of Europe, and efforts to refurbish it did not begin until summer 1944. It comprised more than 18,000 bunkers ("pillboxes") of varied types, gun emplacements, antitank barriers ("dragon's teeth"), and underground installations. How it was defeated provides a good example of the US Army's ability to develop tactics, through combat experience, from official doctrine to pragmatism in the field.

The obstacle

German propaganda and soldiers' rumors had enhanced the image of the *Westwall*, and Allied troops and leaders were often apprehensive. Both the US and Great Britain tried developing some extreme weapons to defeat the daunting defenses, including super-heavy AFVs and mortars, but these

Some infantry regiments formed small patrol groups to conduct special reconnaissance missions; here a team from a Seventh Army unit reconnoiters the Siegfried Line. The pointman carries an M1 carbine, and the others .45cal M3 "grease gun" SMGs with 30-rd magazines taped in pairs for rapid reloading. They wear knit "jeep caps," which have no distinguishable silhouette, and their faces and hands are blackened. (Tom Laemlein/ Armor Plate Press)

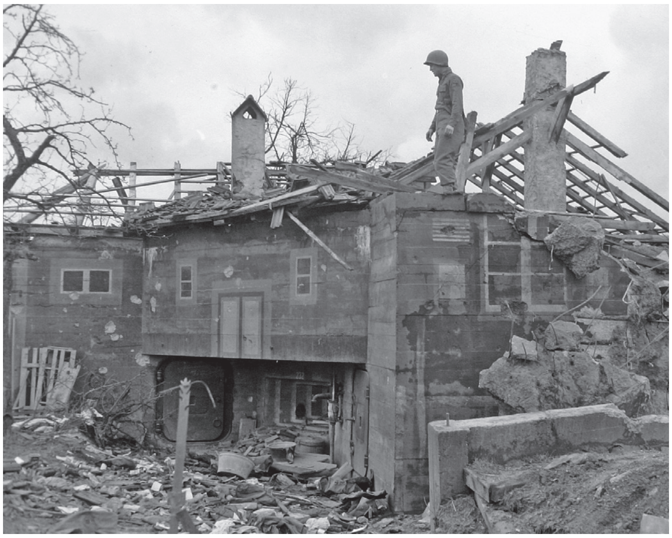
either never arrived or proved unnecessary. The Siegfried Line would be breached the old and reliable way: tank-infantry teams supported by combat engineers, and backed by mortars and artillery. Rather than super-weapons they used tank and TD guns, direct-fire artillery, bazookas, machine guns, flamethrowers, and demolitions.

The XIX Corps, under Ninth Army, provided this description of the Siegfried Line when it breached the defenses in October 1944:

> The "Siegfried Line"... was constructed... before the development of the German doctrine of "strongpoints," as illustrated by the heavy defenses along the Atlantic and English Channel coasts. It was completed as we found it before the Russians had taught the Germans the principle of all-around "hedgehog" defense. Thus [it] contained mainly a large number of reinforced concrete pillboxes for machine guns and 37mm AT guns. There was limited preparation of fortifications for infantry…
>
> The concrete installations in general were 20–30ft by 40–50ft horizontally, and 20–30ft high, of which at least half and sometimes more was underground. The walls and roofs were 4–8ft thick. Each pillbox had living quarters for its normal complement. Fields of fire [generally did not exceed] 50 degrees of arc. Pillboxes were mutually supporting. Four years of neglect... had made the camouflage superb. Undergrowth, turf and disuse made the spotting of some of the boxes extremely difficult. Fortunately British and French intelligence had [aerially] photographed and plotted the construction... and the fruits of their labors were supplemented by recent photography.

The Germans expertly incorporated the terrain into the defenses, utilizing rivers and streams, railroad and road cuts and embankments, dense forest, and broken ground. While pillboxes were stocked

Though most Siegfried Line bunkers were situated in open or wooded country, many of them with only an armored cupola showing above their extensive underground accommodation, some in built-up areas were cleverly disguised to resemble nearby houses, such as this example in Steinfeld. (NARA)



with substantial quantities of food and ammunition, the Germans had removed the 3.7cm AT guns, 5cm automatic mortars, and machine guns to send them to the Atlantic Wall or Eastern Front, and the special casemate mount would accept only the 3.7cm PaK 35/36, 4.7cm PaK 36 (Czechoslovak), MG34, and the old MG08. Fortress machine-gun battalions were raised, and manned by older or physically low-grade conscripts. Morale was usually low, though some would offer fanatical resistance. Only 30–40 percent of the troops assigned to a pillbox remained inside, the rest occupying well-camouflaged slit trenches and foxholes around it and withdrawing inside only when shelled. The approaches were mined; machine

D

FREE FRENCH TROOPS

(See also page 32)

French troops were supplied with American 1941/42 uniforms from spring 1943, though not with the new 1943/44 uniforms; this was justified in a directive of October 31, 1944 as a way "to overcome difficulties and confusion resulting from US and French troops wearing identical clothing." Up to 25 percent of the uniforms issued could not be used, as French and Colonial troops were often of smaller stature than Americans. (Supplies of items were packaged with specific percentages of various sizes, so arrangements were later made to drop the clothing tariffs by one size for issues to the French.)

1: *Grenadier-voltigeur*, First French Army; Alsace, September 1944

Some French units wore US M1 helmets, like this rifle-grenadier, but older French helmets were used by others, or even mixed with the M1 within units. Many in the French 1st Motorized Inf Div (1ere DMI) – the former 1st Free French Div (1ere DFL) – retained the British Mk II helmets they had been issued in North Africa. This young replacement, a recently trained former member of the French Interior Forces (FFI), has received the US flannel shirt and wool trousers, M1941 Parsons field jacket, capped-toe service shoes, and M1938 leggings; a wool overcoat and M1938 raincoat will be issued for the coming winter. French rank insignia were added, but unit insignia were seldom seen on field uniforms; when out of the line some units wore traditional berets, *calots* (garrison caps), and officers' and senior NCOs' képis. Nationality was marked by various blue-white-red tricolor flashes on helmets and/or sleeves. Web equipment was mostly the older tan shade of No. 9 olive drab, although late in the war some dark green No. 7 OD gear was issued. Most units were armed with the .30cal Springfield M1903 rifle, as seen here, while about one-third had Enfield M1917 rifles; M1 carbines and M1928A1 Thompson SMGs were also supplied, though in smaller numbers. There were only limited stocks of M2 rifle grenade launchers available for the M1917, so even in Enfield-armed units the squad grenadier carried an M1903 with an M1 launcher. He carries in his free hand an M17 fragmentation grenade; other rifle grenades included the M9A1 HEAT, M19 WP smoke, and M23 colored-smoke streamer, plus other colored smoke and flares for signaling and marking.

1a: US M9A1 HEAT rifle grenade.

1b: M19 WP smoke grenade.

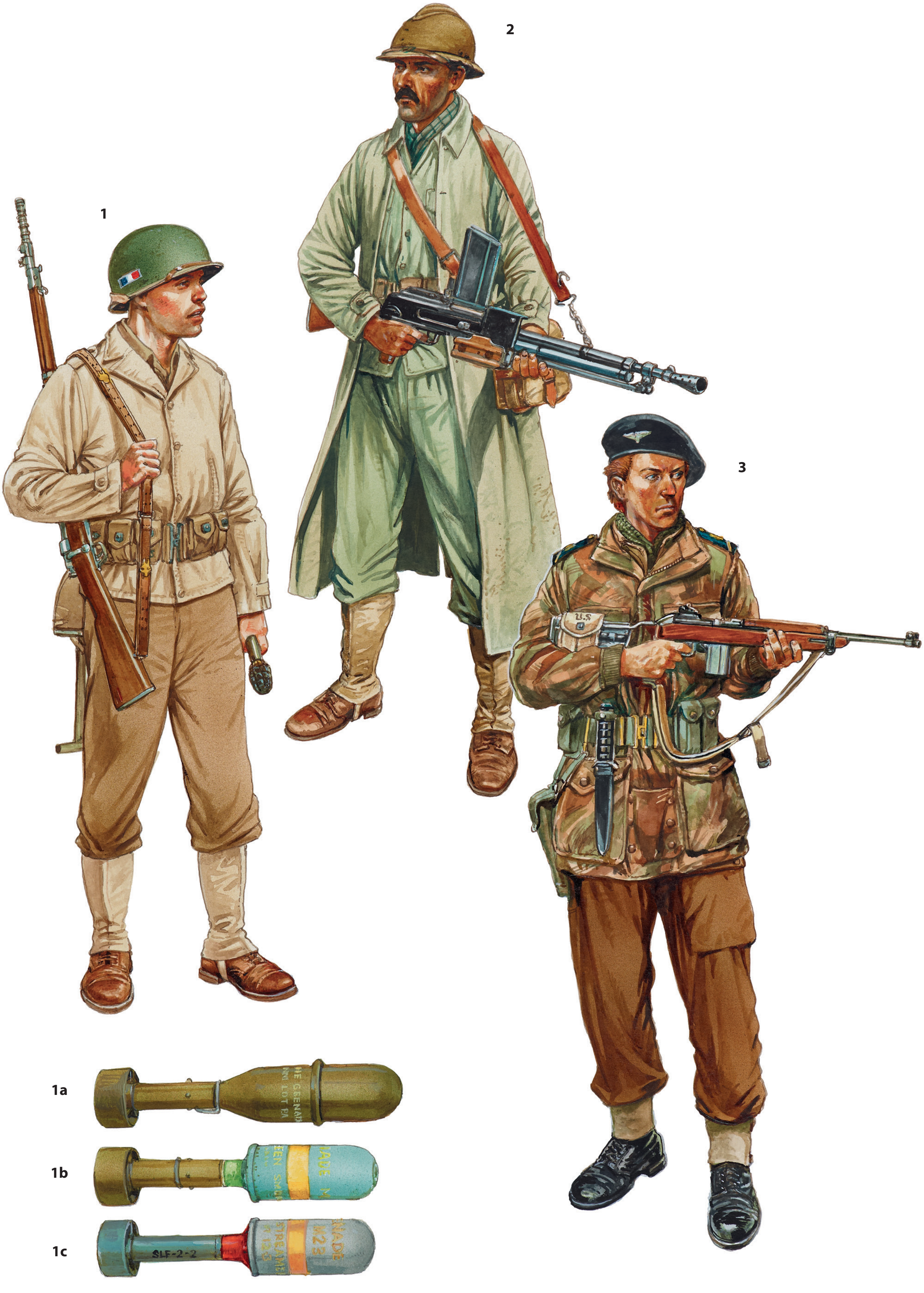
1c: M23 colored-smoke streamer grenade (here, red).

2: LMG gunner, *3e Division d'Infanterie Algérienne*; the Vosges, winter 1944

The herringbone-twill fatigue uniform was worn as field dress (with a national armband) for the August 1944 landings in Provence. This Algerian light machine-gunner of a *Tirailleur* regiment still wears HBT in the cold and wet of winter, under an M1938 raincoat. Like many North African and other troops, this veteran of Italy wears the Mle 1926 Adrian helmet, often issued without any frontal branch-of-service badge. Some *Spahis* (reconnaissance) and other motorized units wore the Mle 1935, a simple domed helmet with a leather-covered brow pad; most tank, TD, and armored-car crews used the US M1 helmet or the M1938 tankers' fiber helmet. At French insistence the .30cal Browning Automatic Rifle was supplied (though to a minimal scale) as the rifle squad's light machine gun, but many units had this French 7.5mm *fusil-mitrailleur* (FM) Mle 1924/29 from stocks in North Africa and caches secreted in southern France. Six of its 25-round magazines are carried here in a Mle 1924 magazine haversack, though the US ammunition-carrying bag was also used.

3: Sergent, *2e Régiment de Chasseurs Parachutistes*/4th SAS Regiment; Netherlands, April 1945

The only Free French units under 21st Army Group were a small Navy Commando unit (1er Bn de Fusiliers Marins), which landed on D-Day and later fought in the Netherlands as part of the British 4 Cdo, and two paratroop battalions. In December 1943 these 2e and 3e RCP were incorporated into the British 1st SAS Bde with parallel identities as the 4th and 3rd SAS Regts respectively. The 4th fought in Brittany and the Loire Valley in June–September 1944, and in the US sector during the Ardennes campaign. On April 7/8, 1945 both units were dropped into the Netherlands on Op "Amherst" to aid the advance of First Canadian Army. The British beret, pulled left in the French style, is black Royal Armoured Corps issue, with a Parachute Regt badge modified by cutting off the king's crown (the unmilitary haircut is from a group photo). Clothing, web gear, and weapons were mostly British, but this NCO has added his French midnight-blue shoulder boards, with a gold eagle badge and single rank chevron, to his Denison smock. Photos show some individual use of the US M1A1 carbine and M3 knife in place of the issue Sten SMG and Fairbairn-Sykes dagger. He also carries an M1911A1 pistol in a British holster rigged low on two brace-attachments, and a Canadian-made two-magazine pouch.


2
1
3
U.S
1a
1b
1c
SLF-2-2

The experience gained while punching through the Siegfried Line served units well when it came to dealing with concrete fortresses, field fortifications, and defended buildings as they plunged on into Germany. The 155mm M12 motor gun carriage, amongst other heavy artillery pieces, proved to be devastating when employed in the direct-fire ("open sights") role against fortified buildings and heavy concrete bunkers. The 155mm (6.1in), 95lb HE shell could penetrate 7ft of reinforced concrete at 2,000 yards' range. In the ETO, six 12-gun battalions were equipped with these "Doorknockers." (Tom Laemlein/Armor Plate Press)

guns inside and outside the pillboxes, and Panzerfausts and Panzerschrecks, provided close-in defense, backed by mortars and some artillery. Assault guns deployed nearby proved more of a problem than the pillboxes themselves, being essentially mobile, low-profile steel pillboxes waiting in ambush. Dug-in tanks and assault guns were calculated to add 40 percent to a defended position, while a pillbox added only 15 percent; since most mounted only one or two machine guns with restricted fields of fire, they served mainly as shelters from bombardment.[4]

The methods

Pillboxes were admirably sited to take advantage of the terrain's defensive potential, but their reduction was achieved through a variety of very simple but sound methods. The elaborate technique for reducing concrete strongpoints employed on the Atlantic Wall, and as taught at the Infantry and Engineer schools in the United States, was neither used nor applicable. One factor that was downplayed at those schools was the value of small-arms fire directed at the embrasures, which was more effective than earlier thought. Since pillboxes typically were able to fire in only one direction over a comparatively narrow arc, they were dependent upon adjacent pillboxes for protection. Neutralizing adjacent pillboxes with direct artillery, tank, and small-arms fire permitted assaulting infantry to work around to the unprotected rear entrance. If the defenders did not surrender, a bazooka or tank round through the door would normally convince them to do so.

The first penetration of the Siegfried Line was near Roeten by Task Force X, 3rd Armd Div, on September 13, 1944. Each infantry battalion had different experiences and developed its own tactics and techniques. The 2nd Bn, 119th Infantry, 30th Inf Div, outlined its experiences as follows:

> The [formal] methods of assaulting a pillbox, that is with pole charges, satchel charges, and flamethrowers, followed by a final infantry assault, were left untried due to the fact that it does not provide close-in fire to cover and button-up the pillbox ["button-up" meaning

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[4] For a detailed illustrated account, see Campaign 181, *The Siegfried Line 1944–45*

> to force gun crews to leave their embrasures and take cover]. Therefore, our assault companies, in conjunction with our tank support, devised an attack plan that rapidly and effectively neutralized eleven pillboxes.
>
> An assault platoon, moving with one section of tanks, advanced into or through the defended area. When fire was received from the pillbox or the entrenchments surrounding it, the tanks immediately placed machine gun fire and direct 75mm fire on the enemy positions. Also the artillery and mortar OPs placed fire on the open entrenchments [this might include VT airbursts, including WP]. The result of these fires was to make the enemy move into the pillbox. At this moment the tanks and assault platoons moved forward, directing all fires on the pillbox embrasures. The result of these fires was to button-up or neutralize the machine gun fire from the pillbox.
>
> As a final stage... the tanks continued to cover by fire while the assault platoon moved forward and took the pillbox – at times literally going in and knocking on the back door and ordering the occupants to surrender. In the few cases where surrender was refused, the use of a satchel charge against the door brought quick capitulations.
>
> One added attachment... used several times... was a platoon of self-propelled tank destroyers. When possible direct fire from [these], in addition to the other fires, speeded up the process of buttoning-up and neutralizing pillboxes.

Artillery fire and airstrikes were also brought down on fortified areas; napalm was sometimes used, but evergreens and wet vegetation limited its effectiveness. White phosphorus rounds from tank guns, bazookas, and mortars quickly burned off the camouflage and effectively blinded defenders inside and outside the pillbox, allowing troops and tanks to maneuver into favorable positions. Bursting WP also showered burning particles into open-topped positions, causing terror. Flamethrowers were not as widely employed as in the Pacific, but saw some use; often, merely squirting a jet of flame in view of the embrasure caused an eager surrender. The 57mm AT gun's accuracy allowed it to put AP and HE rounds into embrasures, but as it was difficult to manhandle into position and lacked WP rounds, tanks were better. Even without VT fuses, 60mm, 81mm, and 4.2in mortar HE and WP rounds airbursting in trees over open positions were effective in driving the external defenders into the pillbox.

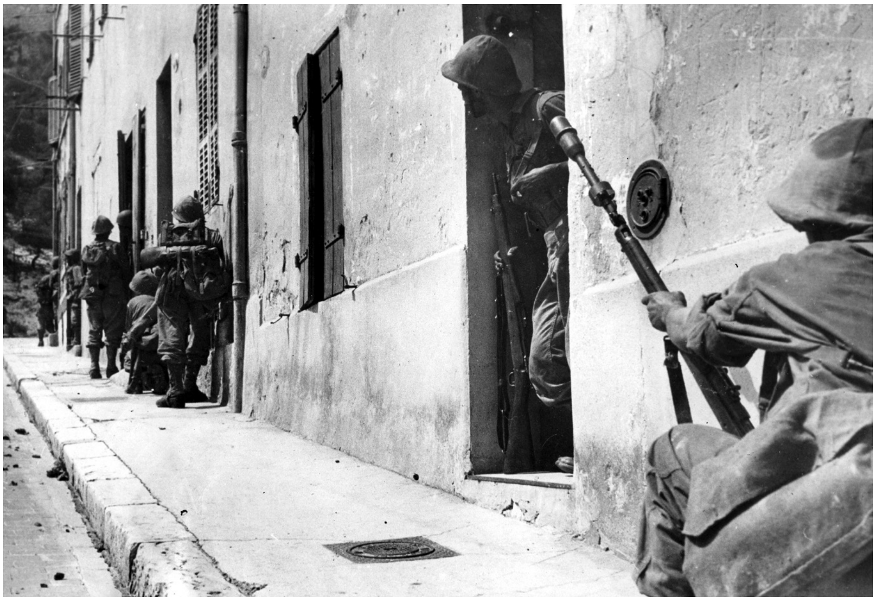
Direct artillery fire with 105mm and 155mm howitzers was sometimes employed. The 105mm M7 SP howitzer of armored field artillery battalions was effective owing to its full-tracked mobility and protection from machine-gun and mortar fire. Although few in number, 155mm M12 SP guns were devastating to pillboxes when fired at pointblank range after 105mm barrages had blown away camouflaging vegetation. An unexpectedly demoralizing weapon was a Sherman tank fitted with an M1A1 bulldozer blade. Once the outside defenders were neutralized or driven into the pillbox and the embrasure suppressed with WP and machine gun fire, the "dozer-tank" bulldozed earth against the embrasure and exit door, and the mere threat of being sealed in often resulted in an immediate surrender. Once neutralized, many pillboxes were demolished to prevent their reoccupation. This might require 1,200lbs (544kg) of TNT, detonated in three different rooms to collapse the structure.

FREE FRENCH FORCES

Since the US was responsible from May 1943 for the re-equipment of the Free French Forces, whose organization largely followed US models, this is a logical place for the brief outline of the subject which is all that space allows (see also Plate D).[5]

The Free French Forces (*Forces Françaises Libres* – FFL) were redesignated Fighting French Forces (*Forces Françaises Combattantes*) on July 19, 1942, but the term "Free French" was generally used through the war. The original core of Gén Charles de Gaulle's FFL had been the few French troops who rallied to him in Great Britain after the fall of France in June 1940, augmented by later escapees and by units from French West and Central Africa. The 1st Free French Bde had fought under British control in East Africa, Syria, and North Africa during 1941–43, later rising to motorized divisional strength (1ere Division Française Libre (DFL), later 1ere Division Motorisée d'Infanterie (DMI)). In 1943–45, however, the bulk of French combatants were provided by the former Vichy French garrison forces, both white and locally enlisted, in NW Africa (*l'Armée d'Afríque*). After initially offering token resistance to the US-British invasion of Morocco and Algeria (Op "Torch") in November 1942, they quickly sided with the Allies. First supported by the British and then by the United States, they went on to provide the French Expeditionary Corps (CEF) that fought in Italy.

By mid-1944 the FFL numbered more than 256,000 in the French Armée B, redesignated on September 19 as First French Army (Gén d'armée Jean de Lattre de Tassigny). Only a small Navy Commando unit, and 2nd French Armd Div (2eme DB, Gén de div Philippe Leclerc) landed in Normandy, the 2eme DB later leading the drive into Paris. The First French Army, with eventually 5 infantry and 2 armored divisions, participated in the August 1944 landings in southern France, later advancing through Alsace and



Free French rifle squad advancing through the streets of Marseilles, liberated on August 28, 1944. They wear HBT uniform and Adrian helmets with cloth covers, and carry .30cal Springfield M1903 rifles. At right, a rifle-grenadier covers the advance with an M2 grenade launcher loaded with an M9A1 antitank grenade. If the squad is engaged he will fire it at once, in hopes of keeping the enemy's heads down while the squad maneuvers. (Tom Laemlein/ Armor Plate Press)

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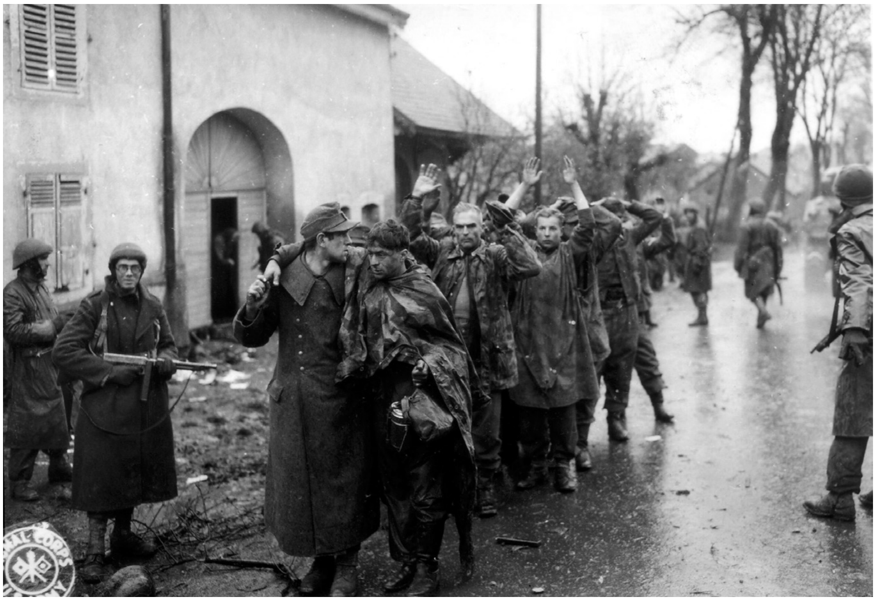
[5] For more unit-specific material, see Men-at-Arms 318, *The French Army 1939–45 (2)*.



Troops of 1st French Armd Div round up German prisoners in Belfort, November 1944. The soldier at left, probably from the division's 1st Zouave Half-Brigade motorized regiment, wears a French M1935 mechanized troops' helmet with a leather-covered brow pad, and a US overcoat. His weapon is a Thompson M1928A1 with muzzle compensator removed, fitted with a 30-rd magazine instead of the more usual 20-round. All armies relied on wool overcoats and blankets for field bedding, and comparison of the coats in this photo shows the superiority of the German type: it is longer, of a more generous double-breasted cut, with a large fold-up collar and fold-down cuffs. (Tom Laemlein/Armor Plate Press)

southern Germany and reaching Austria. Its original veteran divisions and units were gradually augmented by others hastily raised partly from former members of the French Resistance (*Forces Françaises de l'Interieur* – FFI), though some of these were allocated less challenging tasks, facing the several holdout German garrisons on the Atlantic coast. By VE Day the FFL numbered some 1,300,000 personnel of all categories, with 11 operational infantry and 3 armored divisions (see order of battle, pages 58–59), plus many non-divisional units. Their casualties in NW Europe had been 13,432 killed or missing, and 49,513 wounded.

In May 1943 the US formally took over the responsibility for equipping the FFL in NW Africa. French units generally used US tables of organization and equipment, with some modifications and substitutions. Infantry divisions possessed an armored recon battalion rather than a US division's company-sized troop. Instead of Combat Commands in armored divisions, the French referred to them as numbered tank brigades, and to the Reserve Command as the support brigade. The 3eme DB provided personnel and vehicle replacements for the operational 1ere, 2eme, and 5eme Divisions Blindées.

US-sponsored Free French units were issued Springfield M1903 and US-made Enfield M1917 bolt-action rifles. By late 1944 the ratio of M1903s increased as M1917 stocks were depleted, but some non-divisional service units were still using French rifles. US-supplied artillery, AFVs, and other vehicles were of the same main models as used by the US Army, and, once in combat, units received equipment direct from US stocks. M4A2 and M4A4 Sherman medium tanks were provided, with a mix of M3A3 and M5A1 Stuart light tanks, plus M10 tank destroyers. Instead of 75mm M8 full-tracked howitzers, the assault-gun platoons of French tank and recon regiments received 75mm T30 halftrack-mounted howitzers. The French were provided with M5 and M9 halftracks rather than the almost identical M3s and M2s employed by the US Army. Some White M3A1 scout cars were used as substitutes, and in some instances halftracks replaced M8 armored cars in recon units. There were shortages of 2½ -ton cargo trucks, and some French units received 1½ -ton trucks with 1-ton trailers.

BRITISH/CANADIAN 21st ARMY GROUP:

(With additional material by Martin Windrow)

The British *Army Training Memorandum No. 48* issued in May 1944 was unflinchingly realistic: "After more than four years of war, though the army has greatly expanded, it has also lost many of its most resolute and efficient soldiers." Given the shortage of experienced manpower, British doctrine in 1944–45 was firmly based on the principle of expending shells rather than lives.

Learning the trade: Normandy, 1944

The initial Normandy assault forces (built around British 3rd and 50th and Canadian 3rd Inf Divs, and British 6th Abn Div) were rapidly reinforced to create 21st Army Group (Field Marshal Bernard Montgomery), comprising Second British Army (LtGen Miles Dempsey) and the smaller First Canadian Army (Gen Henry Crerar).

Montgomery's doctrine in Normandy suited the strengths and weaknesses of his largely untried troops, who were trained for set-piece operations but mostly lacked the experience to "read the battle" for themselves. Typically, after heavy artillery preparation an assault would be launched on a relatively narrow front, with the infantry following a timed rolling barrage and supported by tanks. Once they had secured an objective they would dig in at once and consolidate. The inevitable German counterattacks were seen by the generals as their best opportunity to defeat the Wehrmacht, and Allied mortar and artillery defensive fire plans were plotted before the initial assaults. To launch counterattacks the Germans had to emerge from their defensive positions, concentrate, and maneuver; then they could be slaughtered by artillery, and cut off and demoralized – though seldom destroyed – by air support.

Broadly speaking, this doctrine worked, and the Germans in Normandy did

Vickers medium machine-gun crew from the Cameron Highlanders of Ottawa – the MG battalion of 3rd Cdn Inf Div – in action at Carpiquet, Normandy, on July 4, 1944. The *bocage* countryside of small fields divided by thickly overgrown banks and treelines was perfectly suited to the Germans' stubborn defensive and reactive fighting, and the Canadians, like the British and Americans, suffered heavy losses. For example, on July 25 during Op "Spring" to capture Verrières Ridge, two 2nd Cdn Div battalions, the North Nova Scotia Highlanders and Black Watch of Canada, suffered World War I levels of casualties – 432 and 307 respectively – in a single day. The Canadians' worst week of the whole NW Europe campaign was August 24–30, when they suffered a total of 4,574 casualties: 1,098 killed & missing, 1,842 wounded, 1,191 sick, and 443 cases of battle exhaustion. This represented more than 25 percent of the total Canadian infantry strength in France. (D. Grant, Library & Archives of Canada, PA 138359) indeed dash themselves to destruction against the Allies' superior firepower and logistics. But the Allied troops, too, had to expose themselves when attacking, and during this bloody three-month campaign 21st Army Group learned its job in a harsh school. Both the minority of infantry and tank veterans of previous campaigns, and the green units, found their experience and pre-invasion training of limited value. The very close terrain greatly reduced visibility, and broke the fighting down into short-range company and platoon actions dominated all too often by dug-in and concealed German weapons. The closely integrated timing planned for infantry, tank, artillery, and air cooperation often broke down; this condemned the infantry to a persistently high rate of casualties, including from "friendly fire," and often left troops stalled in terrain that was hard to defend against counterattack.

Infantry found it particularly difficult to master the transition between the initial set-piece attack, when their main concern was keeping close behind the artillery barrage, and the more fluid and demanding fire-and-movement tactics needed after they lost contact with it. Where they lacked local armor or artillery support the way to limit casualties was to probe forward, identifying opportunities to infiltrate and outflank the enemy before committing whole units. Canadian battalions were quick to form selected "scout platoons" to reconnoiter ahead, but such tactics needed skilled and confident junior leaders who could spot chances to exploit the enemy's errors. For a green captain or lieutenant to master such skills might take up to six weeks in combat, and in Normandy few company or platoon commanders lasted that long.

A typical example of Normandy casualties is 4th Bn Somerset Light Infantry in 43rd (Wessex) Div, which landed on June 23 at full field strength of 36 officers and nearly 700 enlisted men from its administrative establishment of 821 all ranks. On July 5, before being committed to battle, it already needed 3 officer and 62 enlisted replacements. After its first serious fighting at Hill 112 on July 10–13, it needed another 12 officers and 479 enlisted men. One of these was Lt Sydney Jary, who took over 18 Ptn, D Coy as its third commander since landing; from an initial 36 men it had now been reduced to 17, of whom 12 were recent reinforcements.

December 5, 1944: portrait of a young British infantry sergeant advancing into Germany near Geilenkirchen (note the size of the green-and-brown dyed camouflage netting "veil" worn as a scarf).
High officer casualty rates in 1944 meant that platoons were often led in combat by sergeants or even corporals, and many NCOs would be given Emergency Combatant Commissions. As an example of the "butcher's bill" paid in 1944, in the six months between landing on D-Day and the division's disbandment in December the nine rifle battalions of 50th (Northumbrian) Div suffered average casualties of 66 percent among officers and 50 percent among other ranks. (Imperial War Museum BU 1434)

WINTER & SPRING 1944–45

By the turn of 1944/45, on the northern flank of the Allied advance, 21st Army Group had reached an L-shaped frontline in southern Holland and just inside western Germany. The Canadians held a north-facing front, from the North Sea coast at Walcheren Island inland along the Maas river, and into a salient around Nijmegen on the Waal. Here they linked up with the British, who held a mostly east-facing front running southward up the Maas, around the Roermond salient, then eastward again to just east of Geilenkirchen, where they linked up with US Ninth Army. The total strength of 21st Army Group was then approximately 700,000 personnel, of whom some 170,000 were Canadians. About 75 percent of British troops were conscripts (draftees), but all the Canadians were volunteers.[6]

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[6] Conscription for overseas service was controversial in Canada. The National Resources Mobilization Act allowing it was only enacted in December 1944, and only 2,643 conscripts reached combat units.

Organization

Apart from a mass of General Headquarters (GHQ) and army-level troops, at this time 21st Army Group had five corps commands: I, VIII, XII, and XXX British, and II Canadian. These totaled 7 British and 2 Canadian infantry divisions (each with a core of three infantry brigades, each of three battalions); 1 airborne division (one air-landing and two parachute brigades, each of three battalions); 3 British, 1 Canadian, and 1 Polish armored divisions (each with an armored brigade of three tank regiments plus one mechanized infantry "motor battalion," and an infantry brigade with three battalions); and a number of independent armored, "army tank" (infantry support), and special-forces brigades (see order of battle, pages 59–59). British formations were often placed under Canadian First Army command at need.

Due to casualties, two British infantry divisions had already been withdrawn and broken up for reinforcements – in September 1944, 59th (Staffordshire) Div, and in December, 50th (Northumbrian).

During February–March 1945, I Cdn Corps (1st Cdn Inf Div, 5th Cdn Armd Div, and the independent 1st Cdn Armd Bde) and British 5th Inf Div would be transferred up to NW Europe from Italy.

Supporting arms at infantry divisional level included a battalion-size light armored recon regiment; three battalion-size field artillery regiments, an AT regiment, and a light AA regiment; a "machine-gun battalion," with 16x 4.2in heavy mortars as well as 42x medium MGs; and a battalion-size engineer force. Medical services were provided by three field ambulance units

E BRITISH & POLISH INFANTRY

1: Patrol commander, 1st Battalion Glasgow Highlanders, 52nd (Lowland) Division; Gangelt, Dutch-German border, January 1945

British two-piece snow-camouflage clothing for wear over battledress was not general issue but was drawn from unit stores as needed, usually for patrols. Two types existed: one in thin cotton, lacking any pockets, and this heavier windproof type with pockets, as also produced in khaki and camouflage versions. Both types had hoods, but a separate helmet cover was issued; wearing a hood over a helmet is too restricting for safety in combat. Web gear was usually laid aside; ammunition and grenades were carried in the pockets, and weapons were sometimes camouflaged, like this soldier's cloth-wrapped Mk III Sten gun.

2: No.2 of Bren LMG team, 9th Rifle Battalion, 1st Polish Armoured Division; Gilza, Netherlands, October 1944

The only Polish division in NW Europe received complete British uniforms, equipment, and weapons, but added their own insignia. The Polish eagle is stenciled in yellow on the front of the Mk II helmet, and, unlike the British, the Poles displayed a national shoulder title and formation patches on the greatcoat as well as the battledress blouse. In addition to his .303in Lee Enfield No. 4 Mk I rifle and personal 37 Pattern web gear, this soldier is burdened with a second pair of "utility" pouches for four more Bren magazines worn on a neck strap, and the Bren "holdall" containing a quick-change barrel plus cleaning kit.

3: Flank man, 4th Battalion King's Own Scottish Borderers, 52nd (Lowland) Division; Rhineland, February 1945

To avoid "friendly fire" during forest fighting, this "Jock," who is on the flank of his section next to a track used by advancing tanks, has been ordered to rig his personal ground/air recognition panel over his back – an unwelcome order, since it will also increase his visibility to the enemy. This truncated cloth triangle, 40in x 24in x 9in and lemon-yellow on both sides, was carried in the haversack or respirator case. His Mk III "turtle" helmet identifies him as a fairly recent replacement. In winter 1944/45 the camouflaged version of the hooded windproof smock was standard issue to infantry in several formations, including 7th Armd, 52nd (Lowland), and part of 53rd (Welsh) Divs; here it is worn over the leather jerkin (see Plate F3). Each of the two "basic pouches" of the 37 Pattern web gear could hold two 30-round Bren gun magazines, four magazines for the Sten SMG, two folded-up 50-round rifle clip bandoliers, two 2in mortar bombs, or at least two grenades.

4: Rifleman, 1st Battalion Rifle Brigade, 7th Armoured Division; Nieuwstadt, December 1944

Mechanized infantrymen of the division's "motor battalion" were photographed dug in around this town between Christmas and New Year's Day. In a quiet moment, this Bren gunner has laid aside his helmet in favor of the motor battalions' prized khaki beret with his regimental cap badge on dark green backing. Unusually, all the infantrymen in this photo sequence wear the winter "oversuit, tank crews"; apparently not issued solely for static duties, they are shown worn by patrols in Universal tracked carriers (without web gear, so ammo was presumably stowed in the many pockets). He is "brewing up" using hexamine solid-fuel tablets on a folding three-vane stand; this was not universally issued, though the tablets were, and men who lacked either the stand or a personally acquired "Tommy cooker" often improvised stands from twigs.

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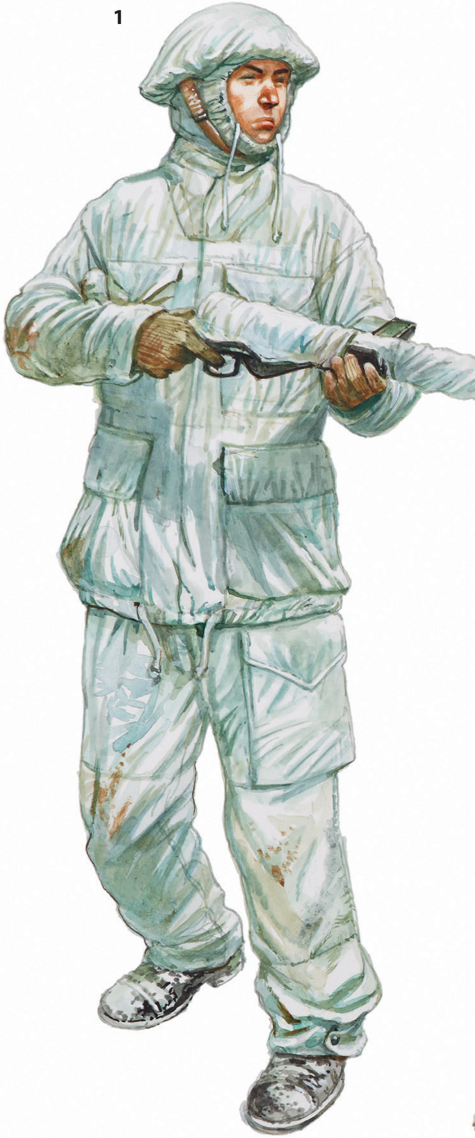

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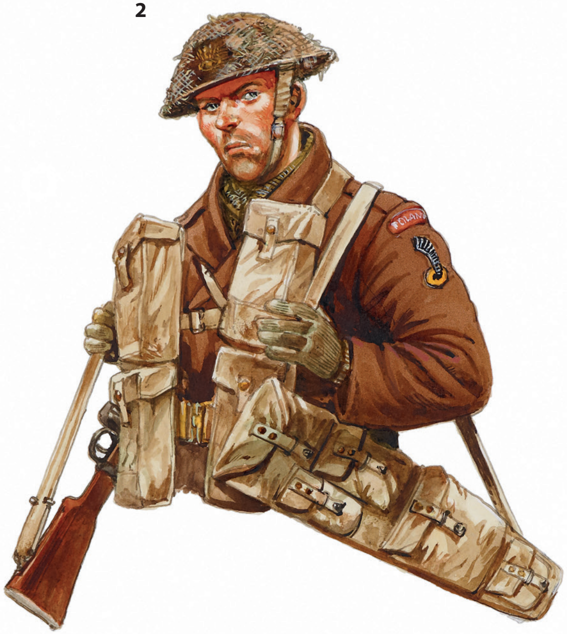

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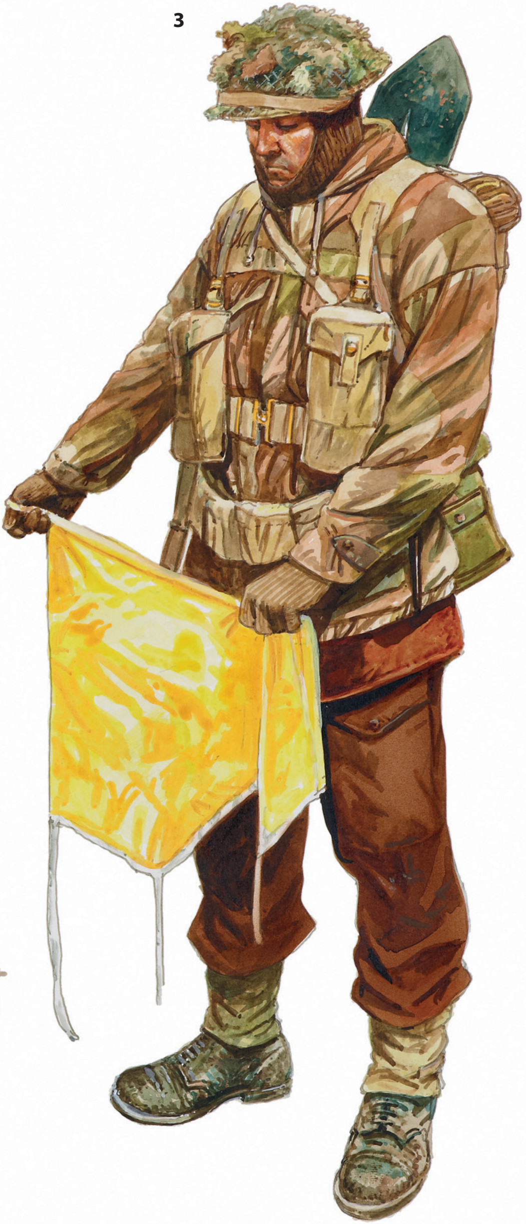

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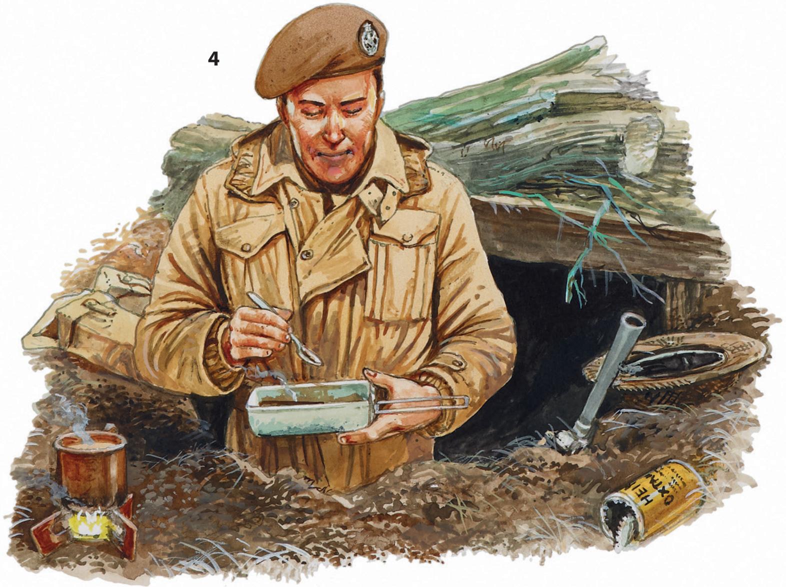

British & Canadian field artillery: regimental equipment

Unit	*Weapon*	*Pieces per regiment*	*Total*
Air-landing regt	75mm pack howitzer	3x 8-gun batteries, each 2x 4-gun troops	24
Field regt	25pdr gun-howitzer	3x 8-gun btys, each 2x 4-gun tps	24
Medium regt	5.5in and/or 4.5in gun[1]	2x 8-gun btys, each 2x 4-gun tps	16
Heavy regt	7.2in howitzer or US 155mm gun	4x 4-gun btys[2]	16
Super-heavy regt	US 8in gun & US 240mm howitzer	3x 2-gun btys – 1x 8in, 2x 240mm[2]	6

Notes:

(1) Either one bty each of 4.5in and 5.5in guns, or 2 btys of 5.5in guns

(2) Heavy & super-heavy btys were not divided into troops

In addition to divisional and corps artillery, **Army Groups Royal Artillery** were allocated by GHQ to support formations as required. The 3rd, 4th, 5th, 8th, & 9th AGRA each had one field regt, four to six medium, and one heavy; 9th AGRA also had one "super-heavy" regiment. Under First Cdn Army command, 2nd Cdn AGRA had two field regiments (of which one was British), three medium, and two heavy (of which one was British). It also had 1st Cdn Rocket Bty with 12x multiple rocket-launchers; codenamed "Land Mattress," these had 16 barrels, ripple-firing 3in rockets.

and two field dressing stations. For operations, the MGs and heavy mortars, engineers, field ambulances, other services, and artillery tasks were parceled out between the three infantry brigades. An infantry battalion had an HQ company, a "support" company, and four rifle companies. The support company comprised a mortar platoon (6x 3in), a carrier platoon (3x Universal tracked carriers), an AT platoon (6x 6-pdr), and an assault engineer ("pioneer") platoon. Rifle companies had three platoons each of three sections (3x 2in mortar, 9x LMG).

For operations, as in the US Army, corps assets were attached to divisions as required, and army and GHQ units might also be made available.

Both armies had suffered heavy casualties and a degree of exhaustion in September–November 1944 – the British, during the failed Op "Market-Garden" and later attacks eastward to the Maas, and the Canadians in opening the Scheldt Estuary and then covering the vital port of Antwerp from the north. While rebuilding their strength both armies were spending a cold,

These 5.5in guns of 11 Medium Regt RA, 9th AGRA, are night-firing near Xanten in support of the Rhine crossings on March 23/24, 1945. Notes in *Army Training Memorandum No. 51* (November 1944) had reminded artillery officers that more enemy casualties were caused by firing a few rounds quickly from many guns, without warning, than by prolonged fire by fewer guns: it was surprise that caused casualties, while continued firing mostly destroyed matériel. While the infantry always had to actually capture and hold the ground, and paid by far the highest price in doing so, one infantry officer wryly described his essential task as "escorting artillery Forward Observation Officers across Europe." The artillery was the largest arm in 21st Army Group; in fall 1944 it made up about 18 percent of total manpower, compared to 12 percent infantry. It was also the most effective: notably efficient communications allowed rapid responses, and German commentators confirmed its devastating impact at every level of operations. General comments (above) on US artillery in most cases apply equally to British and Canadian artillery. (IWM BU 2143)

Newly introduced British weapons

Many improved or replacement items were developed, though not all reached combat units in significant numbers, if at all. Major weapons were as follows:

Comet cruiser tank Mounting a 77mm gun, this was supposed to replace both the Cromwell and the 17-pdr Sherman Firefly (whose ammunition it shared, but with a smaller propellant charge). Saw action with 11th Armd Div from January 1945.

7.2in (183mm) Mk 6 howitzer New barrel mounted on the US M1 carriage for the 155mm "Long Tom"; began replacing earlier marks late in 1944.

.303in Bren Mk III LMG Lightened and shortened development of Mk I & II, intended for e.g. airborne and jungle use. The similar Mk IV was not issued before VE-Day.

9mm Sten Mk IIS silenced SMG Apart from its use by special forces, in 1945 about 2,000 were issued to selected line units for combat testing.

9mm Sten Mk V SMG Of higher-quality manufacture, with a wooden buttstock and two pistol grips and a fitting for the "spike" bayonet, this was available in Normandy, but first issued in quantity to 1st Abn Div for Op "Market-Garden."

.303in Lee Enfield No.5 Mk I Some examples of this shortened "jungle carbine" development of the No.4 Mk I rifle were issued to 6th Abn Div; it was not judged a success.

wet winter of local operations against stubborn opposition, in terrain that was either flooded or thickly wooded – a winter made all the more alarming in December by the German breakthrough south of them in "the Bulge."

Operations

When their offensive recommenced from mid-January 1945 (Op "Blackcock," against the Roermond salient), the two armies attacked across the Rhineland to reach that river, fighting on flooded plains and in the Reichwald forest at the northern end of the Siegfried Line (Op "Veritable"). After the Rhine crossings in March (Op "Plunder"), First Canadian Army swung up through northern Holland (Op "Cannonshot"), and in early May reached the North Sea coast as far east as Wilhelmshaven. On their right, Second British Army drove northeast (Op "Enterprise"), reaching the North and Baltic Sea coasts from Cuxhaven to Wismar, and thus kept the Red Army out of Denmark.

While progress along the learning curve was naturally uneven, the British and Canadian advances up to and beyond the Rhine in 1945 were characterized by a well-practiced and generally successful drill for combined-arms attacks. These tactics rested upon strong and responsive artillery, and the provision of specialized combat-support vehicles from 79th Armd Div (see below). With powerful artillery preparation, the advance would typically be led by mine-clearing "flail" tanks. These were followed by Armoured Vehicle Royal Engineers (AVRE) tanks, with fascines and bridge-laying gear for crossing obstacles, and heavy demolition mortars to deal with roadblocks and fortified buildings. The gun tanks of the attached armored unit would then be accompanied right into battle by the leading infantry unit in armored personnel carriers (APCs), and the infantry attack would be supported by flamethrower tanks. Infantry advancing by night would be guided by 40mm AA tracer fire overhead, under searchlights shining on the clouds ("Monty's moonlight"). During the assault, renewed and adjusted artillery concentrations could be called down quickly, and subsequent enemy counterattacks could be smashed by very responsive defensive fires. The whole effort was underpinned

March 31, 1945: a section from 9th Bn Durham Light Infantry (131st Inf Bde, 7th Armd Div – see "Desert Rat" divisional shoulder patch) aboard a Ram Kangaroo APC of 49 RTR near Weske, Germany. In February, 7th Armd Div had reorganized into battlegroups: e.g. 9th Durhams, with the Cromwell tanks of 5th Royal Inniskilling Dragoon Guards; the towed 25-pdrs of K Bty, 3rd Royal Horse Artillery; a troop of mine-clearing tanks, and AVRE bridge-layers. During the final advance to the Baltic coast the APCs of 49 RTR worked on several occasions with 7th Armd's 131st Inf Bde, and the Kangaroos were carrying the lead battalion when they finally drove into the streets of Hamburg on May 3. (IWM BU 2956)

by engineering and logistic support that far outclassed the German equivalents.

Attrition

While 21st Army Group had a much quieter winter than the Americans, losses again rose sharply during the Rhineland battles of February–March 1945, and constant attrition saw experienced men steadily replaced with nervous and ignorant reinforcements (see below, "Replacements"). Some of these replacements would last long enough to become battle-wise in their turn, but no matter how crafty a soldier became his survival was often a matter of blind luck – mortar bombs fell impartially on rookie and veteran alike. However, bad luck could be compounded by the carelessness of exhaustion, and in combat men sometimes had to go for up to 60 hours with only a couple of hours' sleep. The need to dig slit trenches each time they halted and "de-bussed," often only to abandon them and dig in again somewhere else a few hours later, added to their fatigue.

As in the US armies, much of the time platoons were attacking at only about half the strength envisaged during their training; in addition to the drain of casualties, it was normal to "leave out of battle" (LOB) an NCO and a half-dozen privates from each platoon to form a nucleus for rebuilding it in case of heavy losses. Some lieutenants felt that a fighting strength of around 20–22 was in fact easier to control in the attack than a full platoon of 36 men.[7] In defense, however, being reduced to perhaps half-strength meant that most men had to stay awake during the long winter nights without proper reliefs, thus increasing their chronic exhaustion.

As an example of a typical battalion, in their ten months between landing in Normandy and VE-Day, Lt Jary's 4th Somerset Light Infantry in 43rd Div lost 47 officers and 1,266 other ranks killed or wounded (respectively, 130 percent and 160 percent of establishment). Jary's own platoon was periodically reinforced, but by the time they were approaching Bremen in late April 1945 they were again down to a typical count of 19 all ranks, of whom only one man had been with them since June 1944.

The later-deployed 52nd (Lowland) Div first saw action at Walcheren on November 1, 1944. During Op "Blackcock" in January 1945, Lt Peter White's 10 Ptn, B Coy, 4th Bn King's Own Scottish Borderers suffered 50 percent casualties, most of them in a single 24-hour action when pinned

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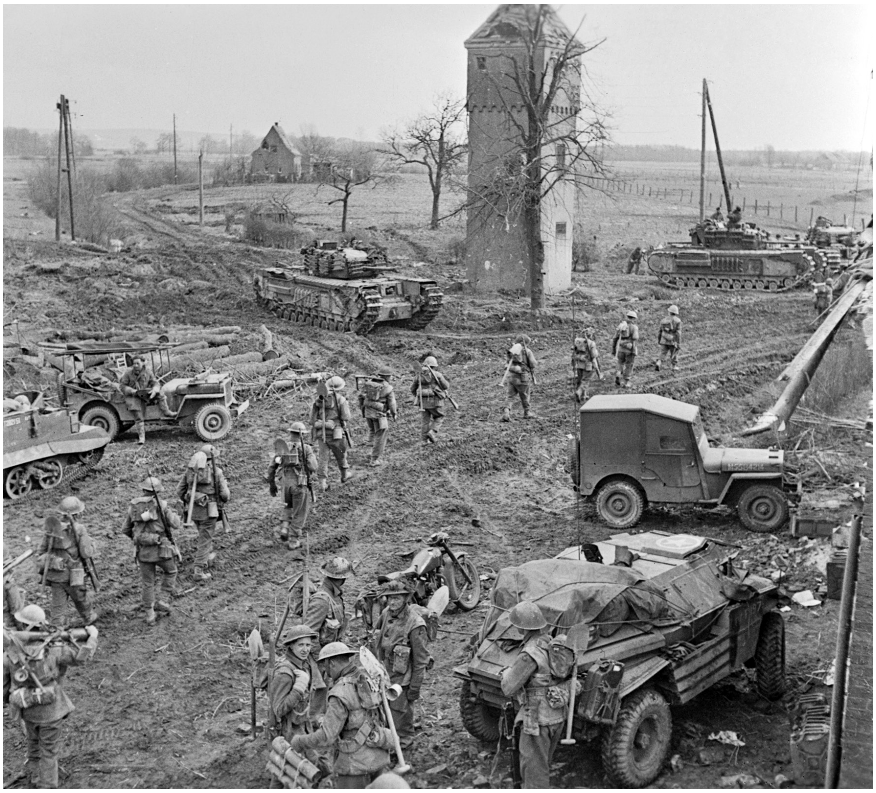
[7] An August 1943 report submitted by a battle-school instructor, LtCol Lionel Wigram, after spending three months in combat with 78th Div in Sicily, underlined this weakness of the "battle school solutions," and claimed that it was exacerbated by the fact that only perhaps half of a typical platoon actually fought back when they came under fire. Wigram suggested that to improve control and effectiveness the platoon should be reorganized from three sections into two-and-a-bit groups, which could be articulated in person by the platoon lieutenant and sergeant: the officer with a rifle-and-grenade group, the NCO with all three LMG teams, plus the 2in mortar team. Wigram's ideas did not find their way into Maj James Brind's *Infantry Training, Part VIII: Fieldcraft, Battle Drill, Section and Platoon Tactics* issued in March 1944. However, the *Amendments No.1* to that manual circulated in winter 1944/45 would indeed recognize the need for more flexibility at platoon/section level, e.g. to allow friends to fight together, and to use the best men where they would do the most good.



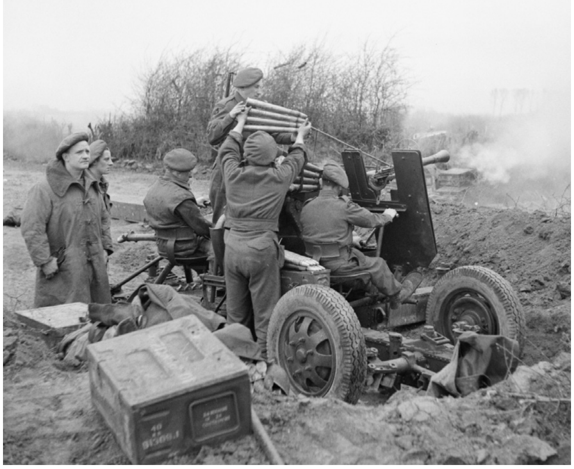
A panoramic view of British troops near Kervenheim, Germany, on March 1, 1945. Here part of an infantry platoon are strung out among typical vehicles: the Churchill tank used by infantry-support Army Tank Bdes, the all-purpose jeep and Universal carrier, and one of the scout cars used by unit HQs and reconnaissance units. Despite Second Army's generally efficient logistics, by the war's end it was running low on a number of vehicle types (e.g. US halftracks), and also more basic items – even battledress uniforms. Officialdom fought a long but losing war to stop British units hoarding, "scrounging," or cannibalizing unserviceable vehicles and equipment rather than sending them to the rear for repair. Entirely replacing items retained by units due to this instinctive quartermaster's urge to amass spares in excess of the official G1098 scale, "just in case," cost the government huge amounts in money and shipping space. (IWM B 15076)

down in an open snowfield (8 killed, 8 wounded, one man with frostbite, and one "bomb-happy" – i.e. psychological collapse). In early April, White's rebuilt platoon was again reduced in a matter of moments from 32 men to 11, by "friendly fire" from a misdirected 17-pdr SP gun. Brought up to 21 men, it was reduced again to 14 a few days later by an 8.8cm shell hitting one of its two trucks while on the move. In their six months at the front White's platoon suffered 20 killed, 19 wounded, and two "bomb-happy," totaling 114 percent casualties.

By VE-Day, 21st Army Group counted some 835,000 personnel, of whom perhaps 175,000 were Canadians. Since D-Day, Second British Army casualties had included some 30,280 killed and 96,670 wounded; First Canadian Army lost around 11,330 killed and 30,900 wounded. The infantry bore some 70 percent of these losses, although they represented only about 15 percent of total strength.

Despite the orthodox opinion of postwar historians that the Germans were generally superior fighting men, defeated only by weight of numbers and firepower, this was rejected by Lt Sydney Jary, MC. While acknowledging the skill and spirit of some German paratroops and other

Approaching the Weser river on April 7, 1945, the weariness of nine months in the frontline shows on the face of the driver of this Vickers MMG-armed Universal carrier of 7th Bn Royal Northumberland Fusiliers. No matter the relative weakness of most German forces encountered in 1945, diehard SS and paratroop units, mines, mortars, *Nebelwerfers*, and "88s" still inflicted a steady drain of casualties on advancing units. The infantry section who happened to be moving between cover when the first concealed MG42s opened fire were often decimated, and at ranges of 1,000 yards or less the first one or two armored vehicles probing down a road were always liable to get "brewed up" by an AT gun. This particular unit had been the integral machine-gun battalion of 59th (Staffordshire) Div, and after that formation was broken up for reinforcements in September 1944 the battalion remained in action until VE-Day. (IWM BU 3189)



LEFT
"A family of brothers": an infantry section from 1st Bn Royal Norfolk Regt, 185th Inf Bde, 3rd Div, photographed in late November 1944. Of the fighting in January–February 1945 one such veteran, Cpl Doug Proctor from 43rd (Wessex) Div, wrote: "We had come a long way since our battle of attrition in Normandy... [We had] developed, with experience, into an accomplished professional army, which was far removed from the 'army of civilians' that had landed at Arromanches... [The platoon] lived and fought for each other as any family of brothers should... This was the type of fighting at which we excelled." (IWM B 12156)

RIGHT
The lack of Luftwaffe opposition led not only to the retraining of thousands of antiaircraft gunners as infantry, but also to 40mm Bofors guns of Royal Artillery light antiaircraft (LAA) regiments being used in the ground role. They provided both direct supporting fire – like this crew of 319 Bty, 92nd (Loyals) LAA Regt, photographed on the Rhine on March 26, 1945 – and tracer fire to point the axis of advance for night-time infantry attacks. Heavier AA guns were also tried out in the ground role, delivering airburst support fire. (IWM BU 2748)

battlegroups that they encountered, he wrote this of his understrength platoon of ordinary English conscript infantry:

"After 1st August 1944, 18 Platoon never failed in any attack. Sometimes we took a little longer than planned, but we always got there in the end. In defence we never lost one yard of ground, nor did the enemy ever penetrate our platoon position, and we always dominated 'no man's land' with our patrols... In many attacks the prisoners we took outnumbered our attacking force, and German units who would continue to resist at close quarters were few indeed. Unlike us, they rarely fought at night, when they were excessively nervous." One of Jary's corporals called the Germans they met in 1945 "an abject lot".

Lieutenant Walter Keith, who joined D Coy, Regina Rifles in 3rd Cdn Div in early March 1945, wrote in similar terms. Only two soldiers of the 32 in his platoon were veterans of Normandy, and only three even of the fighting on the Leopold Canal in October 1944. His men were "mostly fairly small, very young, very quiet and most unwarrior-like. [Yet] I never once had to cajole or threaten or even encourage them to do the job... they automatically did it. The section commanders unhesitatingly led... where they were told to go, and the section followed them."

That most Allied soldiers lacked the fanatical "killer instinct" shown by a minority of the Germans they encountered is surely not a criticism, but a tribute. Unlike the Waffen-SS, most of them were decent, unbrutalized men, who served with a stoic courage lit up by occasional flares of battle-anger.

REPLACEMENTS

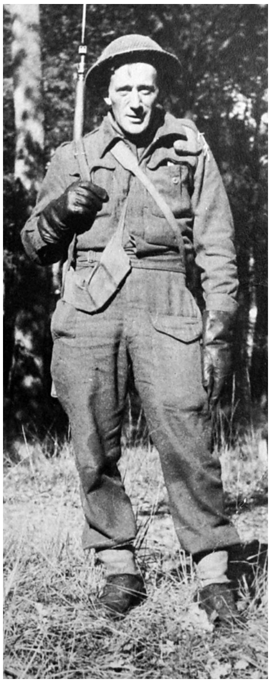
By September 1944, Second Army casualties were running one-third higher than anticipated. Even as early as late July some infantry replacements had been "converted" coastal artillerymen, and the decision was taken to re-role even greater numbers of redundant gunners. This particularly applied to 21st Army Group's AA and searchlight units, whose total manpower in fall 1944 was about 62,000 – nearly as many as its field gunners. With the Luftwaffe now drastically weakened, this luxury could no longer be justified.

A strong AA Command still had to be maintained to defend British ports and Antwerp against V-1 flying bombs, but suitable men were released for retraining, being replaced with Home Guard personnel and women of the Auxiliary Territorial Service. Each light anti-aircraft regiment in 21st Army Group was now reduced from 54 to 36 guns; surplus crews were retrained on field guns, heavy mortars, or as infantrymen (their nickname was "6-week killers," but the course officially lasted 12 weeks). Lieutenant Jary's battalion was receiving ex-AA gunner replacements by November, and by VE-Day a total of nearly 17,000 had been retrained.

In addition to fit younger men employed as individual replacements, artillerymen aged 35-plus or otherwise below Category A1 were retrained "for infantry duties in back areas or ... where holding operations rather than vigorous offensive operations are required." By VE-Day eight complete infantry brigades (301st–308th) had been formed from such men; 27 former Royal Artillery (RA) regiments provided 305th, 307th, & 308th Inf Bdes plus another 18 unbrigaded battalions, which deployed to NW Europe in April–May 1945 on line-of-communication and garrison duties. Each brigade comprised three or four units numbered in the 600 range, designated, e.g. in 305th Inf Bde, 622, 624, & 629 Regts RA (Infantry).

First Canadian Army was too small to break up formations to provide reinforcements for others. Although 3rd Cdn Div had taken the heaviest casualties in summer 1944, it received adequate replacements, but 2nd Cdn Div's battalions – whose shortfall averaged 200 men each at the end of August – took much longer to rebuild with men retrained from the artillery, signals, and service corps. The Canadian advance along the coast against the German Fifteenth Army had faced tough resistance, and the fighting from September 20 to November 7 had cost another 2,250 Canadian infantry killed and some 9,000 wounded or sick (out of a total infantry strength of only about 17,000). The 2nd and 3rd Inf and 4th Armd Divs were each short by 700–800 men on November 1, but the flow of reinforcements then quickened, and by February 1945 they were in better strength than British divisions. Winter 1944/45 offered opportunities for refresher training, and division HQs stressed the need to keep up platoon and section strengths for effective small-unit tactics, if necessary by battalions cutting their four rifle companies to three and redistributing men.

Within the Canadian command, 1st Polish Armd Div naturally faced the greatest difficulties in replacing Normandy casualties (about 50 percent in its rifle battalions) with Polish personnel. Its solution was to enlist willing Polish-speakers among Wehrmacht prisoners of war, but this had limited the readiness of its units in fall 1944.

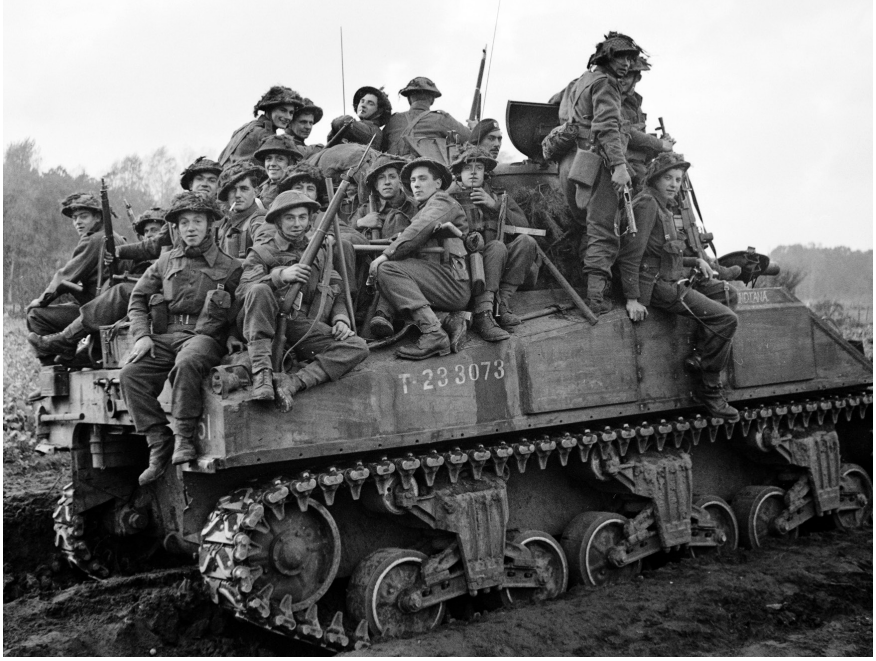


From Normandy onward the need for infantry officers and NCOs to look as much like their men as possible, so as to avoid the attention of snipers, was stressed. Captain Harrison K. Bird, MC, of the Lake Superior Regt (the motor battalion of 4th Cdn Armd Div) was photographed at the Roosendahl Canal in late 1944, carrying only a rifle with fixed bayonet, a bandolier of ammunition clips, and apparently a haversack (or the similar officer's valise) slung behind his left hip.
Canadian officer casualties were just as high as those for the British; additionally, under the "CANLOAN" scheme, 673 Canadian junior officer volunteers also joined British units between April 1944 and February 1945, of whom nearly half became casualties. (Anne S.K. Brown University Library, Providence, RI, USA)

Incorporating reinforcements

In orders of October–November 1944, both FM Montgomery and the Canadian II Corps GOC LtGen Guy Simonds stressed the importance of absorbing reinforcements, ideally along the same lines as described above for US practice. Inevitably arriving demoralized, they should be welcomed into their new unit while it was out of the line, checked for health and for complete kit, rebadged, and briefed. They might arrive after weeks or months in sedentary UK reinforcement units, from role-conversion training in-theater, or after recovery from wounds. Their basic training might be long in the past, so their officer should check and refresh their skills, and when they first went into action he should give them the simplest tasks. Seasoned soldiers were encouraged to take newcomers under their wing; Lt Jary recalled that a Normandy veteran whose nerves had been completely shot since Hill 112 was nevertheless a valuable member of the platoon for his fatherly care of scared youngsters.

Every effort should be made to ensure that a casualty returning to the line after recovery went back to his original unit, or at least to another battalion



Troops from 51st (Highland) Div riding on a Sherman tank near Oudenhout, Netherlands, on October 29, 1944. This overloaded tank carries 18 infantrymen – the official maximum was 15 (see Plate G). The middle soldier of the group silhouetted at top center has a No.18 wireless set, so belongs to a company HQ, and the "Jock" sitting above the final "73" of the tank's hull number has a platoon HQ's No.38 set. This suggests that the tank is probably transporting roughly half of a company HQ, plus a platoon HQ, plus a full rifle section; HQ groups were normally divided between two tanks. While riding, infantry officers usually communicated with each other via the tanks' radios. For intercommunications once dismounted, in addition to their No.19 radio set tanks were to carry a No. 38 set tuned to the infantry company net. Tank unit commanders were additionally ordered to provide the infantry battalion commander with an armored scout car with a No.19 set and operators, for command liaison.

of the same regiment. If even that was impossible, then he should be posted to a unit from the same geographical region as his old battalion, "so that he may find himself amongst men who have the same local connections and interests and the same peculiarities of speech and customs," and an impressively comprehensive list of suitable choices was circulated.

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BRITISH INFANTRY

1: Corporal, 1st Battalion Welsh Guards, Guards Armoured Division; Rhineland, February 1945

Photographed during Op "Veritable," this soldier exemplifies the variations of kit and weapons sometimes seen in the line, even in a highly disciplined Guards battalion. Although his BD blouse is buttoned to the throat, and bears the white-on-black regimental shoulder title and the Guards Armd Div patch, he wears over it and his webbing gear a privately acquired sheepskin jerkin in preference to the standard-issue leather type. More remarkably, he has also "scrounged" a US M1 Garand rifle (presumably, during Op "Market Garden"?), with a US rifle clip bandolier. Preparing to dig in, he carries a couple of No.75 Hawkins grenades; a January 1944 training memorandum illustrated how to use different numbers of these, linked with Primacord, to blow starting-holes for slit trenches, 3in mortar, and 6-pdr AT gun pits. This saved much pick-and-shovel work, allowing a rifle platoon to get dug-in in about 20 minutes.

2: Private, 3rd Battalion Monmouthshire Regiment, 11th Armoured Division; Netherlands, November 1944

This soldier in his battalion's carrier platoon, out of the line after the advance to the Maas (Op "Constellation"), presents a more extreme example of how unsoldierly troops could look in bad weather. The knitted-wool "cap, comforter" could be worn as a watch-cap or unrolled into a scarf. His camouflaged oilcloth "cape, anti-gas" serves as a raincoat; this had a "hunchback" rear extension to fit over the 37 Pattern haversack when it was worn as a "small pack." He is lucky to have acquired a pair of rubber "gun boots", as he sloshes through the mud to collect his carrier crew's hot stew in dark green 2-pint insulated containers.

3: Lance-corporal, 1st Battalion Cheshire Regiment, 11th Armoured Division; Elbe river, May 1945

In the last week of the war, this "Tommy" east of the Elbe takes no chances: he is advancing through a village with his No.4 rifle in the position recommended in an August 1944 manual for snap-shooting. The butt is pulled into his shoulder, so he is ready to swing and lift the barrel at an instant's warning; his second finger is on the trigger, while thumb and forefinger grip the bolt handle ready for rapid reloading **(detail 3a)**. His clothing and gear are standard late-war infantry Battle Order, though his small pack is personally enlarged with a "basic pouch" sewn to each side surface. At the top of his sleeves, below the regimental title in the line infantry's white-on-scarlet, he displays not the black-bull-on-yellow patch of 11th Armd Div but a "regimental flash." A couple of dozen regiments and battalions were authorized various designs in traditional unit colors, worn sometimes below, sometimes instead of formation patches. The Cheshires' flash is a diamond halved in cerise and buff; officially his rank chevron could be in buff on cerise backing, but this was kept for "best BD" worn out of the line.

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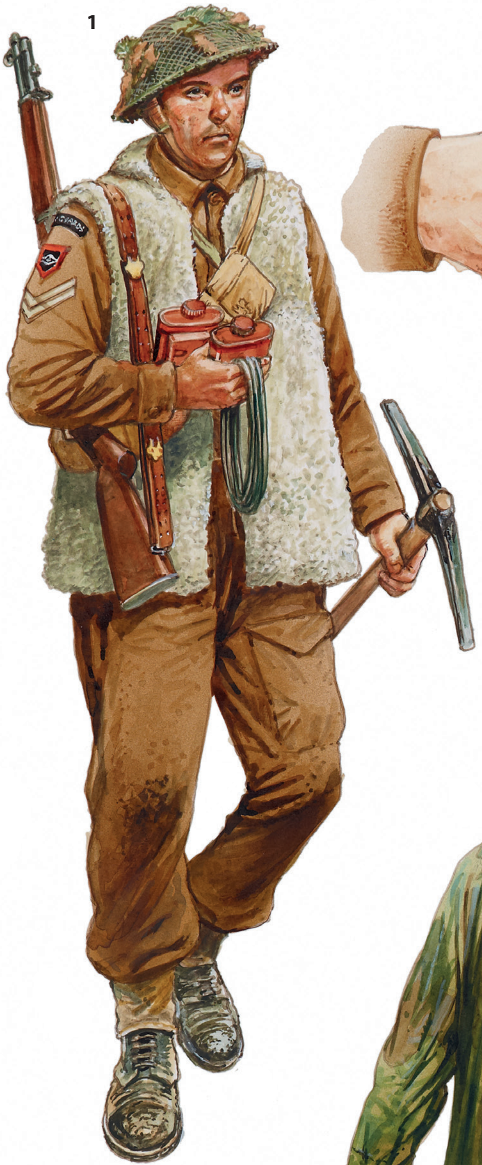

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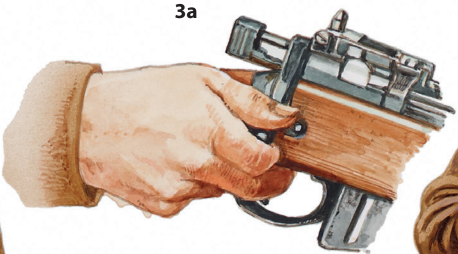

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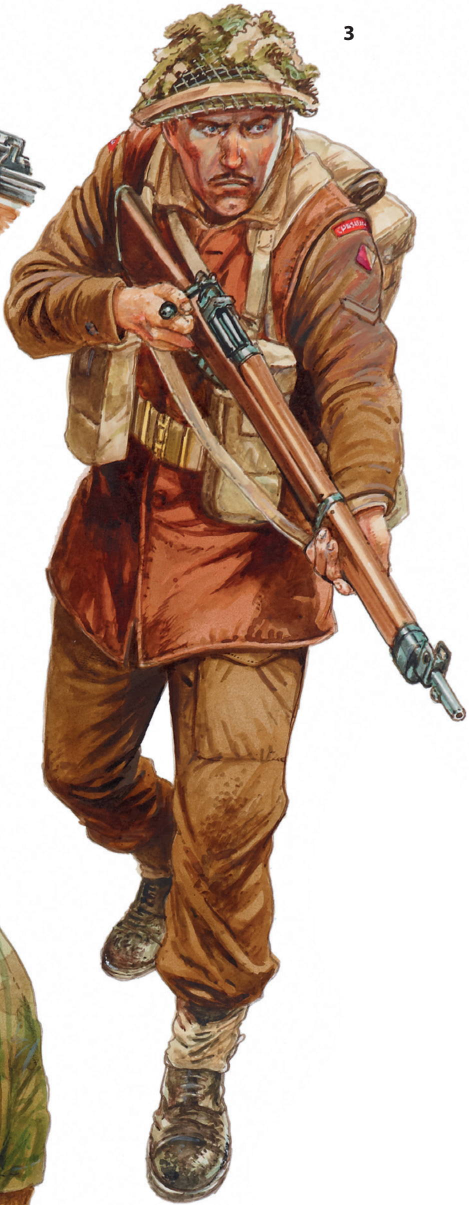

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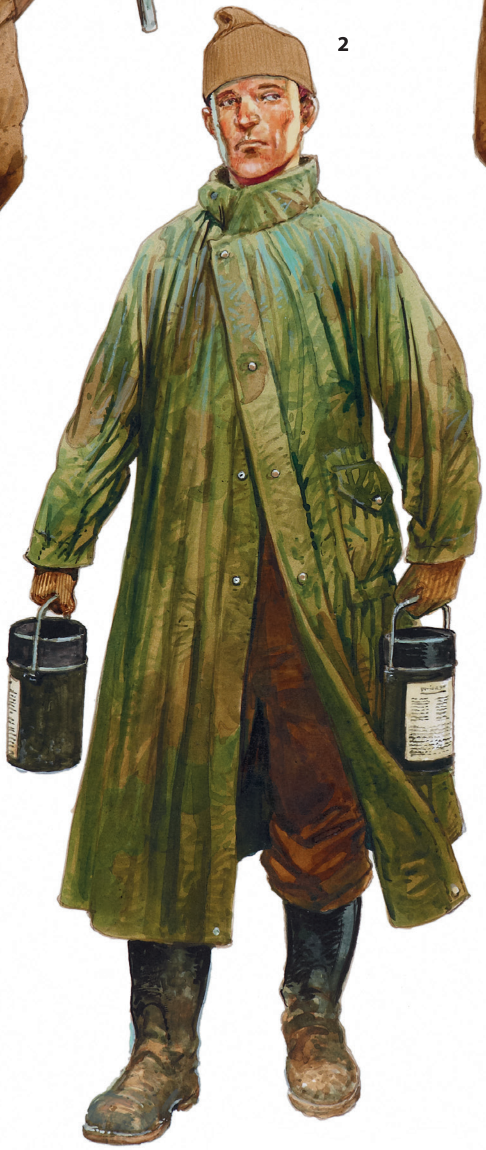

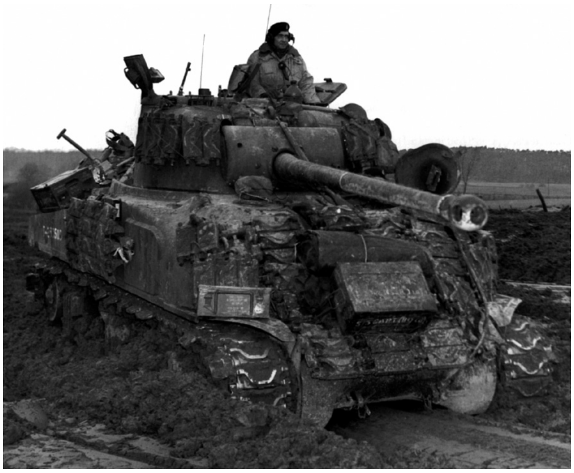

In February 1945, 21st Army Group had 2,600 tanks; British and Canadian Sherman troops comprised at least one 17-pdr Firefly with three 75mm-gun tanks, and some would soon begin to receive two Fireflies. This photo is a visual reminder that the "armored recon regiment" of a 21st Army Group armored division was simply a fourth battle-tank unit. In the Dutch-German border country, Tpr Ed Demars of 29th Armd Recon Regt (South Alberta Regt), 4th Cdn Armd Div, is photographed in the turret of a Sherman Vc Firefly; the tank is typically festooned with spare track plates, ammunition boxes, tools, and the crew's packs and helmets. (Library & Archives Canada, PA113675)

As so often, however, the ideals expressed in official orders could seldom be met under frontline conditions. By 1944–45, men from all over the UK might find themselves wearing just about any cap badge in the Army, and under the pressure of battle many British and Canadian replacements were rushed up to units as soon as they arrived.

ARMOR/INFANTRY OPERATIONS

In 1944, 21st Army Group's armored divisions and independent armored brigades had Sherman or Cromwell medium tanks (246 per div, plus 63 Stuarts in regimental recon troops), and the Army Tank Bdes the slower, more heavily armored Churchill (162, plus 33 Stuarts) specifically for infantry support – although, in practice, any tank unit might be deployed for this task. Infantry divisions had an integral recon regiment with mixes of scout cars, armored cars and carriers, but in Normandy each armored division had an armored recon regiment with medium tanks. They proved quite unsuited to this mission; corps-level armored-car units had to be attached for operations, and the divisional armored recon regiment was soon employed simply as a fourth battle-tank unit.

When working with infantry the tanks' main purpose was to destroy enemy unarmored targets; using them in defense against Panzer counterattacks might sometimes be necessary, but only until AT guns could be brought up. When a tank brigade or regiment was placed under command of an infantry division or brigade the infantry commander would inevitably be the senior officer, but the tank unit CO's right to be closely involved in operation planning, and to "advise" his infantry counterpart, was stressed. At every level infantry and tank officers were supposed to make their plans jointly, and to reconnoiter the terrain together. It was the senior tank officer's decision when to withdraw to a "forward rally" position after an attack. While at least some of the tanks were to remain with the infantry long enough to neutralize any diehard resistance, they could often achieve this from nearby without staying actually on the objective. When the AT guns had come forward the tanks were to be released to a "rear rally" position for replenishment, maintenance, and such little rest as the crews could manage.[8]

Theory and practice

Many British official publications pay lip service to the need for flexible judgment in particular circumstances, but they then usually go on to describe what are actually "best-case scenarios," with careful reconnaissance and inter-unit liaison. On paper, pre-invasion tank and infantry units ideally needed two weeks to train together; in practice, attacks often had to be put together with only a few hours' notice.

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[8] All combat troops suffered from a chronic lack of rest, but tank crews worst of all, due to their nightly maintenance duties. In November 1944 a British training memorandum described symptoms of tank-crew fatigue: headache, nausea, dehydration, loss of appetite, eyestrain; and remedies: meal before action; chocolate, boiled sweets (hard candy), dried fruit inside tank, to keep mouths moist; tea and snack as soon as possible after action; salt tablets to prevent excessive sweating; headband to keep sweat out of eyes, castor oil eye-drops.

Pre-invasion training had varied between formations: 11th Armd Div seems to have paid the most attention to the concept of tank/infantry battlegroups, and the desert veterans of 7th Armd Div the least. A few British senior officers were slow to unlearn the now-inappropriate tactical lessons of North Africa, failing to prioritize giving attacking tanks enough support. A notorious example was Op "Goodwood" on July 18, 1944, when flawed planning and execution resulted in about 400 tanks being lost when exposed not just without close infantry support but, more importantly, at too great a range from their supporting artillery. The traditional British organizational infrastructure sometimes hindered the "sideways" sharing, between senior officers of the different arms, of insights drawn from recent experience. Since the British Army was "horizontally" a more loosely knit institution than the US Army, it was sometimes slower to benefit from the incremental accumulation of experience.

February 26, 1945: for Op "Blockbuster," these infantrymen from the Algonquin Regt, 10th Inf Bde, 4th Cdn Armd Div are riding Shermans of the South Alberta Regt churning through the mud of the Hochwald Gap. Training stressed that the tank-riders must practice mounting and dismounting by day and night; should not dangle their legs over the side, to avoid crush injuries; and should stay awake, so as not to fall off into the path of following tanks.
On February 26 the seizure of the defended village of Keppeln was accomplished when the North Shore Regt of 2nd Cdn Inf Div mounted a whole platoon made up of PIAT teams on Shermans of C Sqn, 6th Armd Regt (1st Hussars). These charged into Keppeln on the heels of an artillery barrage, destroying two Panthers and driving out six others, which allowed the battalion to capture the village.
"Blockbuster" was a phase of 21st Army Group's Op "Veritable," the purpose of which was to clear the Maas and the country west of the Rhine; the first two weeks of operations cost 8,000 British and Canadian casualties, but inflicted nearly three times that many on the Wehrmacht.
(L&AC, PA113907)

The infantryman Lt Jary recalled that in Normandy, denied scope to maneuver by the *bocage* terrain, tanks were "reduced to blind, slow and highly vulnerable infantry-support guns." From August 1944 the British infantry were trained to ride on tanks, and during that fall much effort was put into improving armor/infantry tactics. Examples of best practice were circulated, and although the shifting of units often interrupted the familiar relationships that brought the best results the drills increasingly became automatic. The provision of APCs from October 1944 – though there would never be enough of them – also began to improve the odds for combined-arms attacks.

During the Canadian advance along the Channel coast in August–October 1944, if tanks were not available to infantry battalion battlegroups these routinely included a troop of M10 SP tank destroyers, as well as attached combat engineers, mortarmen, and machine-gunners. For example, for Op "Astonia" at Boulogne in September the North Nova Scotia Highlanders battlegroup had an attached Sherman squadron from 10th Cdn Armd Regt (Fort Garry Horse), plus a whole range of specialized armor: Kangaroo APCs, mine-clearing tanks, AVRE obstacle-clearing tanks, and Crocodile flamethrower tanks (see below, "British 79th Armoured Division"). Denied such riches, the North Shore (New Brunswick) Regt battlegroup had only an M10 troop from 3rd AT Regt, RCA for armored support. The frequency with which M10s had to be deployed in this role led to crews being tactically trained for it, in two-gun maneuver sections.

The independent 2nd Cdn Armd Bde earned praise from the infantry units it supported, but a report by its 10th Armd Regt after operations with 2nd Cdn Div in South Beveland in October 1944 stressed some of the characteristic difficulties of tank/infantry cooperation. Below divisional level, it was essential that tanks should be placed "in support of" infantry units, not "under their command," since tank commanders understood much better the capabilities and proper positioning of armor. The typical infantry commander wanted tanks in close proximity to boost his men's morale, but "he should consider where he wishes fire to come down, rather than where the tanks themselves should be located." Also, the infantry should always remember that "tanks cannot *hold* the ground they capture".

September 21, 1944, near the Nijmegen bridge over the Waal river: a 17-pdr gun of 24 AT Regt RA with Guards Armoured Division. This gives a good impression of the massive size of the towed 17-pdr, the high effectiveness of which (especially with APDS shells, which began arriving from September 1944) was offset by the difficulty of towing it, and the time it took to emplace and conceal. There were complaints that infantry commanders insisted on it being deployed too far forward and then withdrew in the face of counterattacks, leaving the guns to be overrun. There were also constant problems with Quad towing vehicles, which were underpowered for a gun weighing nearly 3 tons; only some lucky regiments received halftracks or turretless Crusader tanks as prime-movers. Armor-Piercing Discarding Sabot shells became available in small quantities for 6-pdr AT guns in mid-1944. They roughly doubled penetration, but shortages meant that few crews got the chance to master their peculiar trajectory before using them in combat. (IWM B 10171)

In November 1944, Montgomery issued notes codifying the lessons learned about tank/infantry cooperation, including the need for units to "marry up" early in an operation, and for tank officers to accompany infantry patrols to reconnoiter the ground they would fight over. He stressed that success depended upon intimate cooperation between all arms within an armored division. The most flexible arrangement for a divisional operation was probably (a) the armored brigade HQ, controlling two of its tank regiments, the motor battalion, plus one battalion from the infantry brigade; and (b) the infantry brigade HQ, controlling the armored recon regiment, the third tank regiment, and the other two infantry battalions.

Wasp flamethrowers

This variant of the Universal light-armored tracked carrier, first used by the Canadians in Normandy at the end of July 1944, proved very valuable – provided the infantry gave the vulnerable carriers maximum supporting fire and smoke during their advance to within 140 yards of the target, and followed close behind to assault it as soon as the Wasp had flamed it. Their distribution scale seems unclear; a platoon of six served in each infantry division's MG battalion, but there are also references to their use by 3rd Cdn Div's 7th Recon Regiment. A platoon was also included in the independent MG company of both Canadian and British armored divisions and independent armored brigades.

A November 1944 report praised their effectiveness against field defenses and pillboxes that were proof against infantry battalion weapons. At 100 yards a well-practiced team of driver and gunner could squirt flame directly into a pillbox's embrasure, with hideous results. Their psychological effect was such that a brief burst of flame was often enough to induce surrender or flight, and enemy troops never tried to shoot it out with them – Wasp losses were always to mines or long-range weapons. If a slope in the terrain allowed, flame projected at a high angle dispersed into a "golden rain" effect that was deadly against trenches and other open positions. A representative example of their use by 3rd Cdn Inf Div comes from the bitter fighting against German paratroopers in Moyland Wood on February 21, 1945 during Op "Veritable." The Royal Winnipeg Rifles judged that they owed the success of their two-company assault mainly to two successive trios of Wasps, the second three coming up when the first three ran out of flame-fuel.

Antitank warfare

Doctrine demanded that the infantry protect themselves against enemy armor. Each infantry battalion had a platoon with 6x 6-pdrs; each corps and infantry division had a Royal Artillery/Royal Canadian Artillery AT regiment with 16x 6-pdrs and 32x 17-pdrs; and each armored division's AT regiment had 48x 17-pdrs, two of its four 12-gun batteries being self-propelled.

The characteristics and use of the 6-pdr were largely identical to those of the US 57mm AT gun (see above), apart from their sometimes having superior APDS ammunition. Repositioning guns in battle was seldom possible, and in Normandy a withdrawing unit often left its emplaced 6-pdrs in exchange for those of the relieving battalion. In the advance, towed battalion guns were supposed to get on to a captured objective within 15 minutes to meet a Panzer counterattack within a half-hour, but in the Normandy *bocage* this was unrealistic. If infantry had no tanks or SP guns in support they often had to try to withstand the initial shock with their Projector, Infantry, Anti-Tank (PIAT) man-portable AT projectors; with their HEAT projectiles these were as destructive as bazookas, but much more difficult to handle. After the August 1944 breakout the British AT units, like their US counterparts, encountered dwindling numbers of actual Panzers, though German SP assault and AT guns would remain common. The AT platoons provided their battalions with immediate direct support against a wide range of "hard" and "soft" targets alike.

October 12, 1944: for lack of AFV targets, an Achilles 17-pdr SP gun of 75 AT Regt RA, 11th Armd Div, firing in the infantry-support role against enemy pillboxes on the Dutch-German border. The 17-pdr AP round could penetrate 6ft of concrete, and during the last winter of the war increased scales of HE ammo were also issued to Archer and Achilles SP units. Despite their vulnerabilities, from Normandy onward British and Canadian SPs often gave distinguished service in the infantry-support role, both in defense and attack.
While Sherman tank troops each had one 17-pdr Firefly, and those of the Cromwell-equipped 7th Armd Div one 17-pdr Challenger conversion, the infantry-support Army Tank Bdes with Churchills lacked an equivalent weapon. When troops of Royal Artillery 17-pdr SP antitank guns were attached to them for particular operations, the brigade commanders were sometimes permitted to retain them afterward. (IWM B10733)

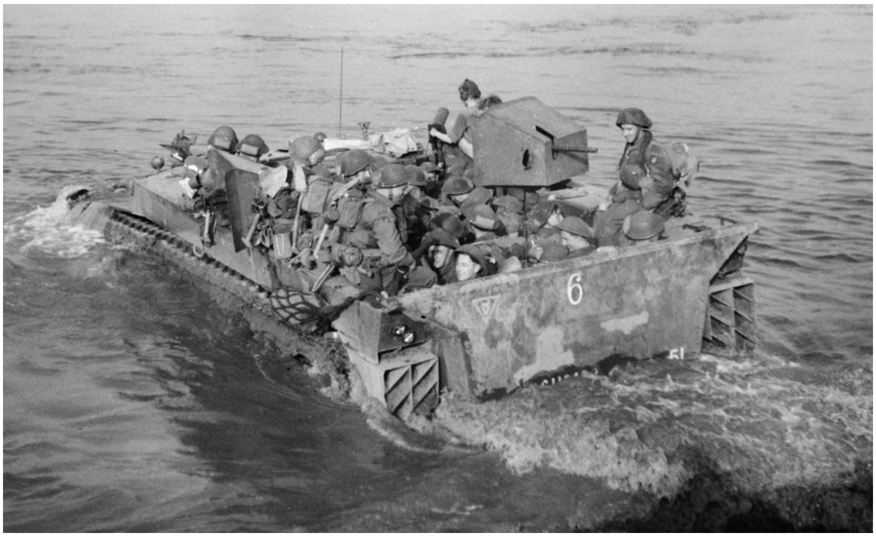
The SP batteries had either the 3in-gun M10 (officially, the "Wolverine") or SPs mounting the 17-pounder. This was either mounted rearward on a Valentine tank chassis as the "Archer", introduced in October 1944, or conventionally in the M10C "Achilles" based on the Sherman. Infantry division AT regiments were typically equipped with a mix of towed 17-pdrs and Archers or Achilles. (After Op "Switchback" in the Breskens Pocket, 3rd Cdn Inf Div complained of difficulty operating what they called "M-10s" on the narrow dyke roads, because "the gun faces the rear" – evidently, Archers.) The missions, and the drawbacks, of the SPs were as described above for the US Army. They operated in dispersed batteries and troops, so junior officers were vulnerable to the misuse of their guns by more senior ranks.

SPREADING THE LESSONS

"Dyke-and-*polder*" fighting

In the northern Rhineland the Germans deliberately flooded large areas, thus condemning the Canadians to fight in flooded fields crisscrossed by raised dykes. The latter provided only limited and exposed routes for vehicles, and even AFVs often got bogged down if they left them. The flooded meadows or *polders* were overlooked by islands of higher ground where the enemy might fortify farm buildings, construct pillboxes, and/or dig weapons into the flanks of dykes. Chilled to the bone, infantry might have to wade chest-deep for a half-mile while potentially exposed to enemy fire. Notes issued by HQ 3rd Cdn Inf Div after Op "Switchback" in October 1944 included the following points:

Since the Germans often cut the dyke roads, engineers with bulldozers must keep close up with the infantry. Infantry must be given extra training in mine-lifting and clearing obstacles and booby traps; the size of infantry pioneer platoons should be increased to take some of the burden off the engineers, with the infantry taking responsibility for opening routes for their own rear-echelon vehicles.



The LVT Buffalo's ability not only to "swim" carrying an infantry platoon but also to climb steep, muddy banks made it especially valuable in the flooded terrain on the Dutch-German border. While this photo shows a Buffalo carrying infantry of 5th Bn Dorsetshire Regt, 43rd (Wessex) Div across the Rhine on March 28, 1945, two LVT squadrons each from 5 and 6 Asslt Regts RE, 79th Armd Div had already greatly aided the Canadian advance through the flooded Rhineland during Op "Veritable" in February. The LVT-2 could carry an infantry platoon; the LVT-4, with a dropping rear ramp (as here), could alternatively take loads such as a Universal carrier or a 6-pdr AT gun. Before the Walcheren operation in November 1944, the 79th Armd Div workshops had fitted each Buffalo with a .30cal and a .50cal MG, and units often added heavier weapons such as a 20mm Polsten cannon or a 3in mortar, so they could give their passengers a useful volume of direct supporting fire during assault landings. (IWM BU 2449)

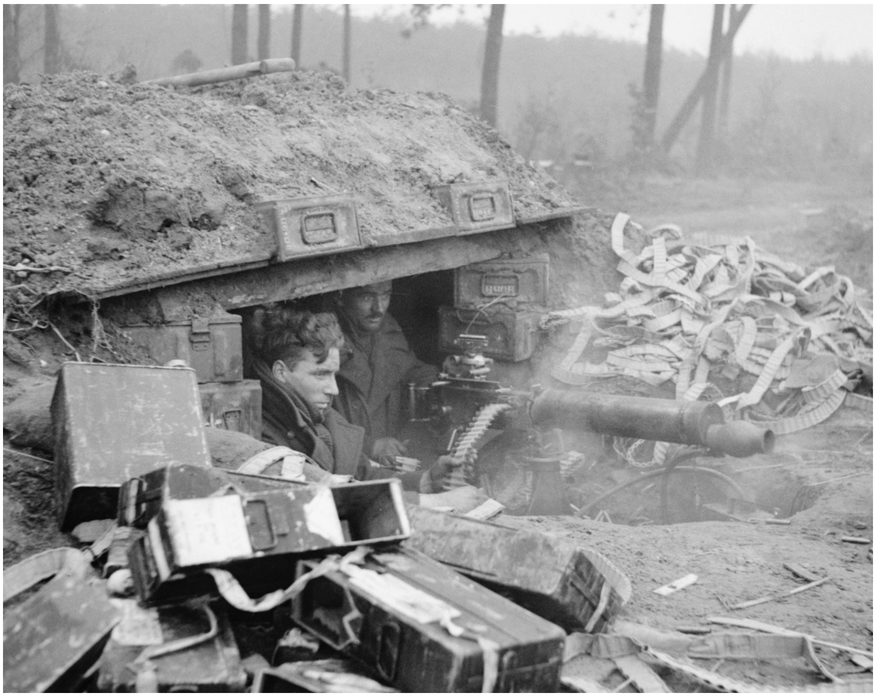
M-10s could provide close support if the infantry reconnoitered positions for them in advance, but the tankers of the Fort Garry Horse discovered the danger of exposing their Shermans on the dyke roads. Initially one four-tank troop, together with an armored-car troop from 8th Recon Regt, led the way for an infantry company, but after one German 7.5cm AT gun had knocked out three armored cars and three tanks the infantry pushed ahead of the armor. Typically, an infantry company would advance with an artillery forward observer officer (FOO), who radioed fire corrections to keep the enemy's heads down; one or more tanks or M10s and at least one Wasp followed, to come up on the flanks when needed. Armor could deliver effective supporting fire from hull-down positions if the infantry first blew holes in the tops of the dykes for them to fire through, using PIATs or "grenades" (presumably, No.75 Hawkins grenades).

Night fighting

An after-action report by 6th Armd Regt from 2nd Cdn Armd Bde after Op "Blockbuster" in the Rhineland in February 1945 describes supporting battalions of both 2nd and 3rd Cdn Inf Divs during attacks around Keppeln in the Hochwald Gap. Dividing the regiment between two divisions overstretched it: after supporting one battalion a squadron had barely any time to refuel and rearm, and none for maintenance, rest, or a proper briefing before being ordered to assist another battalion.

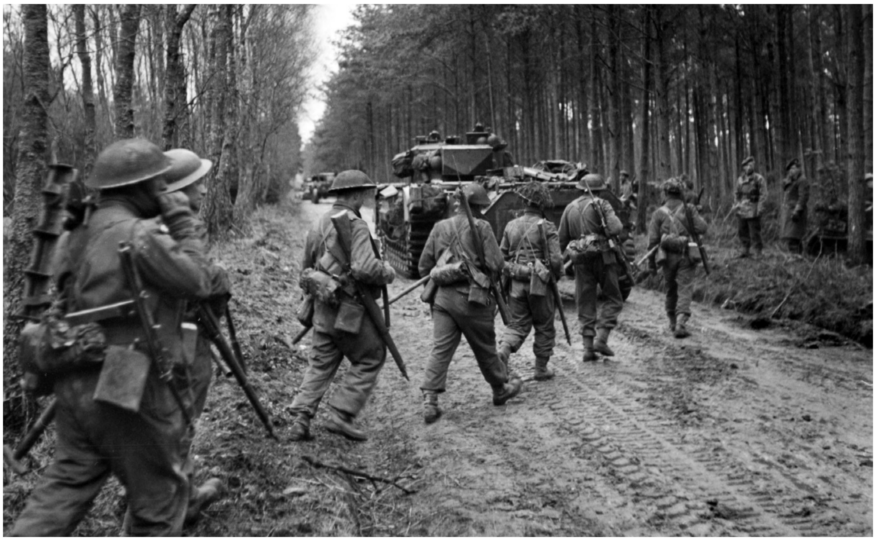
In the first 24 hours, 33 tanks were lost: 14 to enemy fire, 5 to mines, and 14 bogged down. By the end of the operation the regiment had only 14 serviceable tanks out of 62, but (interestingly) had suffered only 40 personnel casualties, which confirms the relatively low proportion of losses to enemy fire. Deploying tanks to support infantry before "shooting-light" in the early morning boosted the infantry's morale, but increased the strain on tank crews and their vulnerability to Panzerfaust teams. When objectives had been occupied they came under heavy fire from enemy SP guns and mortars, so medium artillery should be placed "on call" even to tank sub-units.

A report after "Blockbuster" by 9th Inf Bde, 3rd Cdn Div summarized some of the difficulties of night operations. These might originally have been planned for daylight but got delayed, so the plan had to be adapted at short

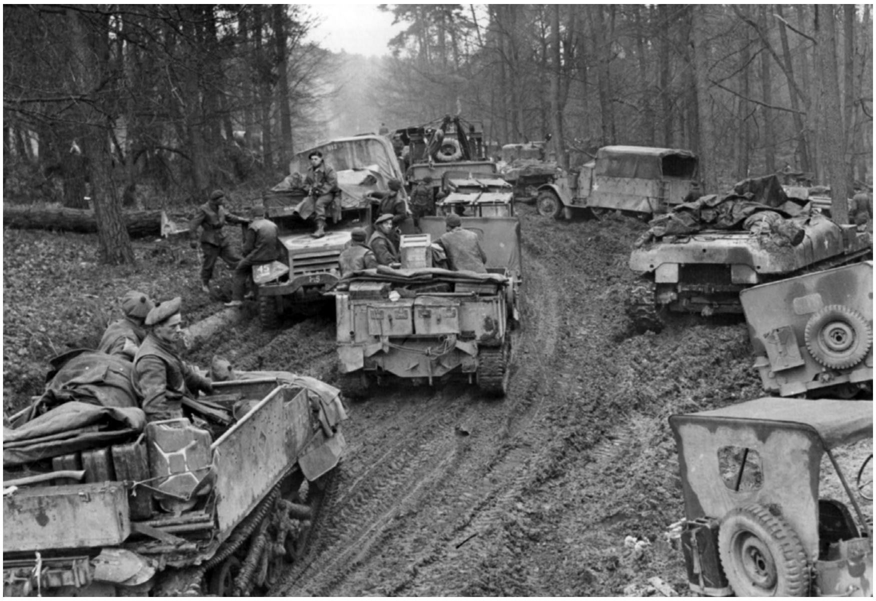


February 1945: a Vickers MMG team from 8th Bn Middlesex Regt, the integral machine-gun battalion of 51st (Highland) Div, surrounded by evidence of prolonged firing. This weapon pit has reasonably good overhead cover to protect it from mortar fire. A training memorandum in November 1944 criticized British infantry for neglecting this, but Lt Peter White of 4th Bn King's Own Scottish Borderers, 52nd (Lowland) Div recalled his platoon carrying "liberated" crosscut saws and felling axes to cut logs for roofing-over slit trenches when they were operating in woodland astride the Siegfried Line. In the dyke-and-*polder* fighting, dykes often gave advancing troops cover on one flank, but the other had to be protected by fire as the infantry moved in carefully controlled bounds from one dyke to another, and machine-gun units were particularly effective for this task. Another factor of fighting in flooded terrain was that the sodden ground reduced the killing-power of artillery, but at least the radio reception for artillery liaison was good. (IWM BU 1785)

notice after dark; in future, it was essential to make two plans – one for daylight execution, and one for nighttime. Preliminary reconnaissance by daylight was of little use to infantry trying to find their way around a badly shelled town in the dark. Each battalion should be provided with a spare radio set tuned to the brigade net, carried on a vehicle other than that of the battalion commander, or the loss of the latter could cut battalion/brigade communications for hours. More use of runners to speed up company/battalion communications was recommended. In towns the No 18 set often functioned badly, but stringing telephone cables was sometimes feasible. At night, tank units could seldom operate effectively with a frontage of more than two tanks "up."



Forest fighting: infantry from 2nd Bn Seaforth Highlanders, 51st (Highland) Div, with support from Churchills of 34th Army Tank Bde, photographed in the Reichswald on February 10, 1945 while moving up to engage German paratroopers of 2. Fallschirmjäger Regiment. Tank crews could see adequately when among trees at least 12ft high and 3ft apart, but were blind when in plantations of shorter, more thickly spaced saplings. A Churchill tank could push over a shallow-rooted conifer with a 2ft-diameter trunk, but a broad-leaved treetrunk of more than 9in diameter would stop it. (IWM B 14454)

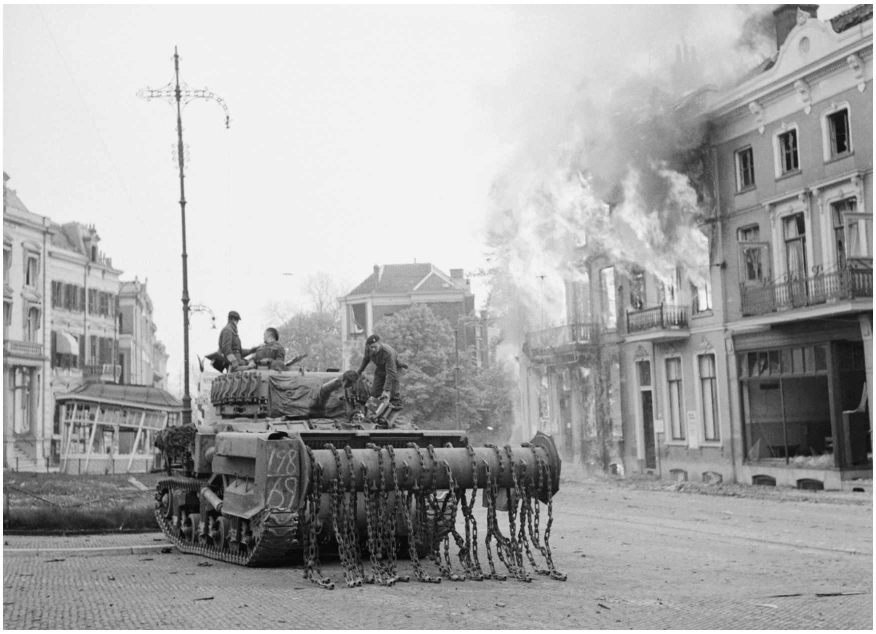


Photographed on a muddy track through the Hochwald on March 6, 1945, the carrier-borne Cameron Highlanders of Ottawa pass other Allied vehicles including jeeps, a Ram Kangaroo, and a halftrack. Incidentally, on the general subject of woodland fighting: with regard to the serious Allied fears about potential diehard Nazi guerrilla activity in the Bavarian forests following the formal surrender, 21st Army Group *Infantry Notes No. 13* of July 1945 interestingly quotes at length from the bestselling historical novel *Northwest Passage* by Kenneth Roberts, set during the 1750s French-Indian War, in which the character "Sgt McNott" instructs new recruits to Rogers' Rangers in forest fieldcraft. (L&AC, JHS47443)

A British memorandum of 1945 stressed the need for more night training in orientation and silent movement on unfamiliar ground. It also detailed an updated plan for battalion night attacks, from approach-march navigation right through to the completion of consolidation and resupply on a captured objective before first light. It emphasized that the reserve platoon in each rifle company must "mop up" the objective at once, rather than leaving this to follow-up companies.

Forest fighting

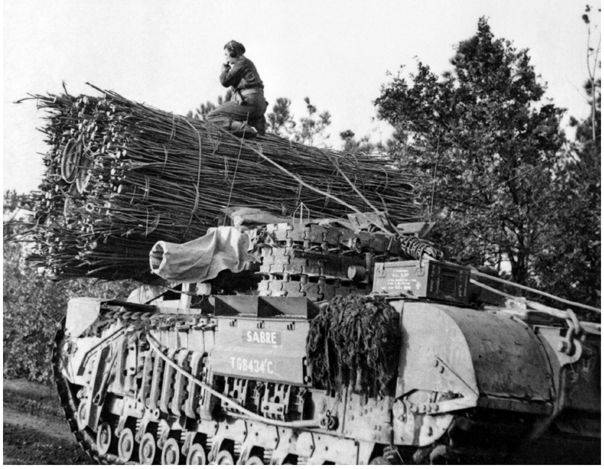
A British summary of tank/infantry cooperation circulated after the fighting in the Reichswald in February 1945 made the familiar point that infantry



Sherman Crab mine-clearing flail tank of 1st Lothians & Border Horse (30th Armd Bde, 79th Armd Div) in the blazing streets of Arnhem, Holland. This tragically famous town was not finally liberated (by 49th Div, under Canadian First Army command) until April 15, 1945. The Crab's turret gun was retained, since flailing raised a lot of dust and drew enemy fire, and the tanks needed to be able to provide mutual support. The Crab advanced at little more than 1mph, clearing a lane about 8ft wide; the lashing chains could detonate Teller mines buried 5in deep, and a dozen or more could be cleared before new chains had to be fitted. However, flail tanks were ineffective on cobbled road surfaces, and were always vulnerable to improvised mines using such heavy ordnance as aerial bombs or naval shells. (IWM BU 3515) must lead through thick woodland, to flush enemy tank-hunters, but tanks must lead through clearings and on open tracks. Given the limited vision from a closed-down tank – and equally, the danger to infantry of tanks drawing fire, or setting off mines – the infantry should not "hug" the tanks, but should screen them from at least ten yards ahead and out to both flanks.

During daylight advances the tanks should spray MG fire ahead of them even if no targets were visible. They should only fire HE shells when in clearings, to avoid tree-burst casualties to their own infantry; among trees AP shells were still effective. At night the troops of a tank squadron might advance in parallel single files, preferably using a track as a centerline. Tanks and infantry could advance together by bounds provided movement lights were used; the infantry should have some high-visibility item on their backpacks (white enamel mugs were good), and should signal each halt in the alternating advances with red-filtered flashlights. Tanks should spray the treetops ahead of the infantry with MG fire, but without tracers.

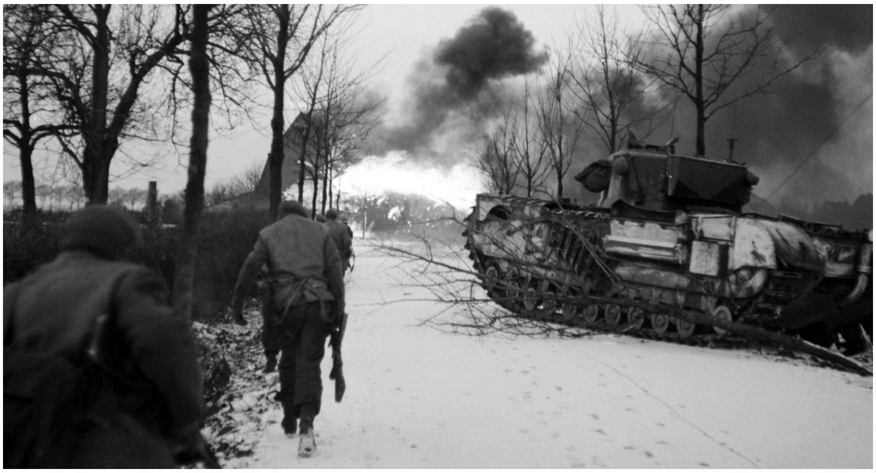
The contemporary report by 6th Cdn Armd Regt after Op "Blockbuster" agreed that coaxial and bow MG fire was the most useful in woodland, where the enemy seldom used Panzerfausts so as to avoid premature detonations against trees.



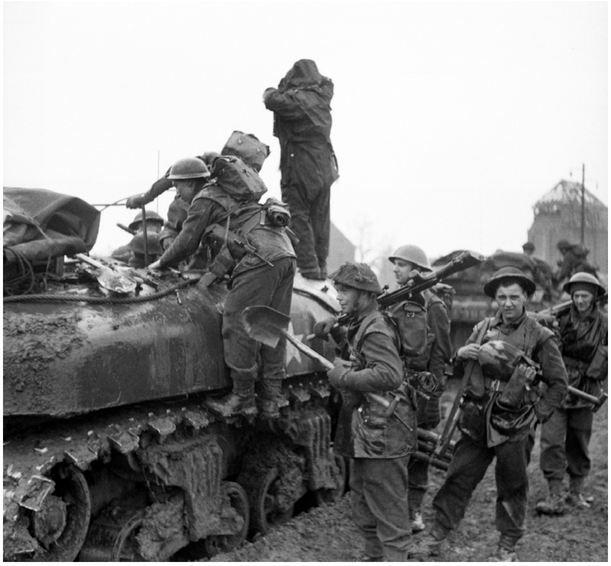
October 23, 1944: an agile observer atop an Armoured Vehicle Royal Engineers (AVRE) carrying a large ditch-crossing fascine during 53rd (Welsh) Div's advance near Oss, Holland. Alternative fittings for these Churchill AVREs of 79th Armd Div's 1st Assault Bde RE included a 30ft assault bridge, a frame of demolition charges, or "Snake" hose charges, all of which could be operated from inside the tank. However, a crewman had to emerge from a hull-top hatch in order to reload the turret-mounted 290mm mortar with its 40lb bomb. (IWM B 11135)

BRITISH 79th ARMOURED DIVISION: "THE FUNNIES"

An asset particular to 21st Army Group from D-Day onward was the unconventional and versatile 79th Armd Div, whose range of combat-support tanks and other specialist equipment increased steadily during the campaign. The standard establishment of a British armored division was about 14,960 men and 350 AFVs of all types, in two brigades plus artillery and divisional troops; at one stage 79th Armd Div numbered 21,000 all ranks and 1,566 AFVs, in five brigades plus additional specialist "wings" to study particular tactical problems. Brigades were task-organized, with units re-roled, re-



January 20, 1945: Churchill Mk VII Crocodile flamethrower tank of 141 Regt RAC (31st Armd Bde, 79th Armd Div) in action in support of infantry at St Joost, Holland; the range of the flame jet was up to 120 yards. An analysis concluded that this terrifying weapon was at least twice as effective as a gun tank when supporting infantry in the assault. In the action photographed here, two Crocodiles were lost to German artillery fire; this was unusual, although the towed fuel trailer was often shot off. (IWM B 13944)



equipped, and cross-posted at short intervals, which demanded high standards of skill and leadership. They supported both British and Canadian divisions, and in some instances units were loaned to US Army formations.

The "funnies" based on Shermans were Duplex Drive (DD) swimming tanks and Crab mine-clearing flails; the other equipments were all based on the Churchill. By early 1945 the DDs equipped only two regiments, the flails and flamethrower Crocodiles three units each. The three regiments of 1st Asslt Bde Royal Engineers employed AVREs, mounting a short-range but very destructive 290mm mortar and carrying a variety of obstacle-crossing and breaching gear; the turretless Ark version had ramps and runways that turned the tank itself into a mobile bridge.

March 2, 1945: infantry from British 3rd Div, who wear a mix of Mk II and Mk III helmets, boarding a Ram Kangaroo APC of 49 RTR (31st Armd Bde, 79th Armd Div) for the assault on Kervenheim. The infantry had to "de-bus" the same way, clambering up and rolling out over the edge, which was dangerous when under fire. Each squadron of the carrier regiment had 16 APCs. Riding in a Kangaroo was deafeningly noisy, uncomfortable, and cramped, and in cold weather there was competition for places next to the warm rear engine-compartment bulkhead. (IWM B 14972)

Armored personnel carriers

Although carried in US-supplied halftracks, British Universal carriers, or Canadian armored 15-cwt 4x4 trucks, the mechanized infantry "motor battalion" within the armored brigade of each armored division was often unable to keep up with the advancing tanks. Otherwise all infantry, including those of an armored division's infantry brigade, were carried to the battle area in trucks, and marched thereafter. The need for genuinely integrated infantry/tank battlegroups was recognized in Normandy after the costly shocks of June–July 1944; infantry then began to ride on the tanks, but the need for a better armored personnel carrier was also addressed.

The name "Kangaroo" was applied to surplus tracked armored chassis converted into armored personnel carriers. The first were M7 Priest 105mm SP guns from the artillery of 3rd Cdn Div; when these were due for replacement with Sexton SP 25-pdrs the GOC II Cdn Corps, LtGen Simonds, ordered their conversion. The original unit was the ad hoc 1st Cdn Armd Carrier Sqn, officially formed only on August 28, 1944 mainly from men of the Elgin Regt; 78 of the 100 planned APCs were ready in time for its actual first action in Op "Totalize" on August 7–8, when casualties among 4th Cdn Inf Bde were measurably reduced. The Priest-based APCs were replaced at the end of September with lower-profile Canadian Ram tanks with the turret removed; the unit was redesignated 1st Cdn Armd Personnel Carrier Regt in October 1944 (and again, as 1st Cdn Armd Carrier Regt, in January 1945). Also in October, the British 49th Royal Tank Regt became the second Kangaroo unit; both served under 79th Armd Div, with dispersed squadrons allocated to shuttle infantry battalions forward for particular attacks.

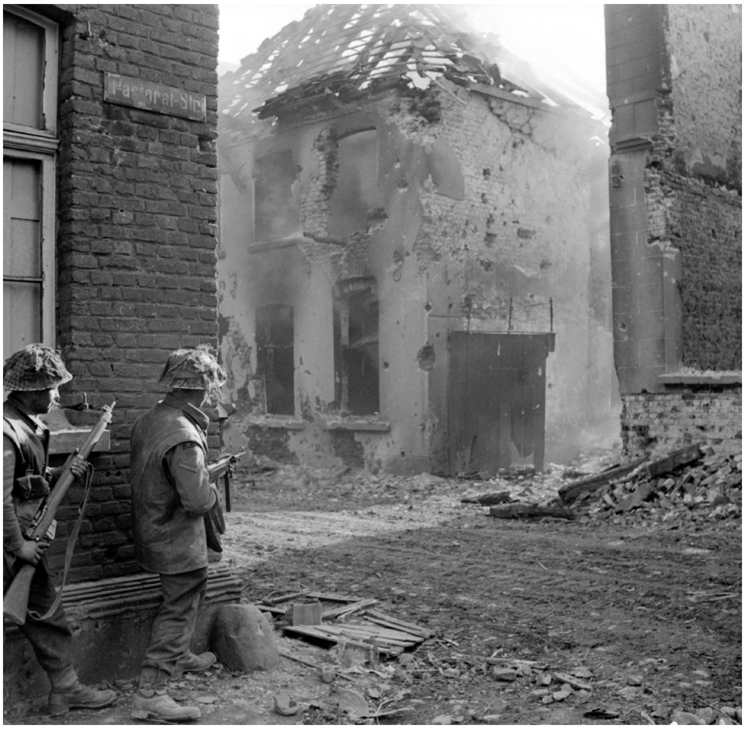
The new APCs were employed to speed up the momentum of attacks by the British and Canadians throughout their advances across the Low Countries and northern Germany. Both APC units saw hard fighting during Op "Veritable" between the Maas and the Rhine in February 1945, successively lifting infantry of 15th, 43rd, and 3rd Inf Divs, 11th Armd Div, and 3rd Cdn Inf Division. Following the Rhine crossings in March, 49 RTR took part in Second Army's drive to the Baltic and the Elbe while 1st Cdn AC

Regt accompanied the Canadian hook up into northern Holland. By now Kangaroo tactics had evolved; they no longer dropped their infantry off on the edge of the battlefield, but worked in close cooperation with tanks in the assault. The crews of 49 RTR fitted extra "scrounged" .30cal and .50cal MGs, and habitually charged into the assault behind a hail of covering fire.

Amphibious carriers

During summer 1944 the first British unit – 77 Asslt Sqn Royal Engineers (ASRE), again of 79th Armd Div – received about 20 US-supplied LVT-2s and LVT-4s, called "Buffaloes" in British service. During the battles to open the Scheldt Estuary for traffic upriver to Antwerp, on October 8–12 some 100 LVTs went into action for the first time, when 5 Asslt Regt RE (ARRE) landed troops of 3rd Cdn Inf Div for the assault on the Breskens Pocket. On October 25, 174 Buffaloes carried troops from 52nd (Lowland) Div across to South Beveland. By the time of the Walcheren landings (Op "Infatuate," November 1), 79th Armd Div had two operational Buffalo regiments: 5 ARRE and 11 RTR. For "Infatuate" 11 RTR loaned a squadron to 5 ARRE, and another was attached from 6 ARRE, which then had mixed equipment including Buffaloes, DUKWs, and M29 Weasels. Thus reinforced, 5 ARRE landed units from 1st and 4th Cdo Bdes in Buffaloes launched from tank landing craft.

In February 1945, four Buffalo squadrons made vital contributions to the painful advances by 2nd and 3rd Cdn Inf Divs during Op "Veritable" on the flooded approaches to the Rhine. Numbers were increased, and for the Rhine crossings 150 Buffaloes of 11 RTR, East Riding Yeomanry, and 77 ASRE from 5 ARRE carried troops of 15th (Scottish) Div and 1st Cdo Bde, while 4 RTR and 1st Northamptonshire Yeomanry transported infantry of 51st (Highland) and 3rd Cdn Inf divisions. Carried on tank transporters, the Buffaloes later accompanied British VIII Corps' advance all the way to the Elbe, and at Lauenberg on May 2 infantry of 1st Cdo Bde and 15th Div crossed that final river courtesy of 11 RTR and 77 Assault Squadron Royal Engineers.



March 1945: men of 1st Bn Royal Norfolk Regt, 3rd Div during street-fighting in Kervenheim; in such actions platoons often dumped their backpacks and tools and left them under guard. *ATM No. 51* of November 1944 stressed the importance of getting within 30 yards of an enemy-held house before charging it; showers of grenades should then be followed up with SMG bursts, including up through ceilings, while the attackers moved from room to room so fast that the defenders had no time to react effectively. Note that the lance-corporal here has acquired a German MP40 in preference to a Sten, whose 9mm ammunition it would accept. Veterans recalled that worn-out Sten magazine springs would feed no more than 20 of the 32-round capacity, and that its weak return spring caused dangerous accidental discharges if it was dropped on its butt. (IWM B 15046)

INFANTRY SMALL-UNIT TACTICS

Infantry battle schools

It is seldom understood that courses in infantry "battle drills" taught at divisional "battle schools" were intended to teach *methods of instruction in fire-and-movement to encourage initiative* rather than a rigid tactical doctrine. The officers and NCOs who attended them were supposed to disseminate what they learned when they returned to their units, teaching soldiers to react imaginatively to sudden battlefield situations rather than waiting for specific orders. However, some senior officers feared that by the time the drills filtered down to the rank-and-file they would inevitably be received as rote-learned rules, leading to stereotypical behavior. Lieutenant Jary believed this to be true: before D-Day the troops "were over-trained in and bored stiff with basic infantry tactics which, as far as they went, were good. [But] much of this training had unfortunately been in the hands of… instructors who themselves lacked battle experience and imagination… Dogma had assumed the proportion of holy writ." Jary believed that instruction relied too much on the expected availability of tank and artillery support in all circumstances; it thus robbed subalterns of the initiative that they would need in more fluid combat, and caused needless casualties.

Once formations reached the front the opportunities to attend divisional battle schools were fleeting, but Montgomery still stressed their importance. He ordered that instructors should be rotated often from frontline units, and the lessons apparently did become more realistic and useful. In 52nd (Lowland) Div, Lt Peter White wrote that while out of the line in December 1944 officers and NCOs attended a divisional battle school for a full ten days, covering both tactics and the latest German weapons. A representative 1945 report from one such school shows that it covered a wide range of specifics. For example, it noted weaknesses in patrol and map-reading skills, and in laying and lifting trip-flares. The instructors recorded the high proportion of "dud" 2in mortar illuminating rounds reported from the frontline; and they recommended using

(Continued on page 60)

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BRITISH TANK-RIDERS, 1945

1: Regiment/battalion loading plan (part)

By this date many Sherman troops had 2x 17-pdr Fireflies and 2x 75mm-gun tanks. An official loading plan had been devised; when published post VE-Day it assumed 10-man infantry sections, but in wartime 8 men was the maximum. How rigidly such a complex scheme was followed seems questionable. Some tanks carried only 4–5 men, since some HQ groups were divided between tanks for safety; most carried 8–10, but some 15 – the theoretical maximum – or even more. Tank regiments had three squadrons and infantry battalions four companies, so the division of companies between squadrons was inconsistent; e.g., in the listing below, see B Sqn, 4 Tp, and C Sqn, 3 Troop.

This schematic is simply representative, illustrating part of the order of march of a Sherman regiment of A, B, & C Sqns carrying an infantry battalion of A, B, C, & D Coys, plus both tank and infantry units' tactical headquarters. Note that individual tank numbers are allocated here simply for identification within the schematic.

A Squadron (not illustrated). Its 1 Troop carried no infantry; its 2, 3, & 4 Troops carried A Company's HQ and 1, 2, & 3 Platoons, distributed 8–10 men per tank over 14 tanks, as per B Coy (below).

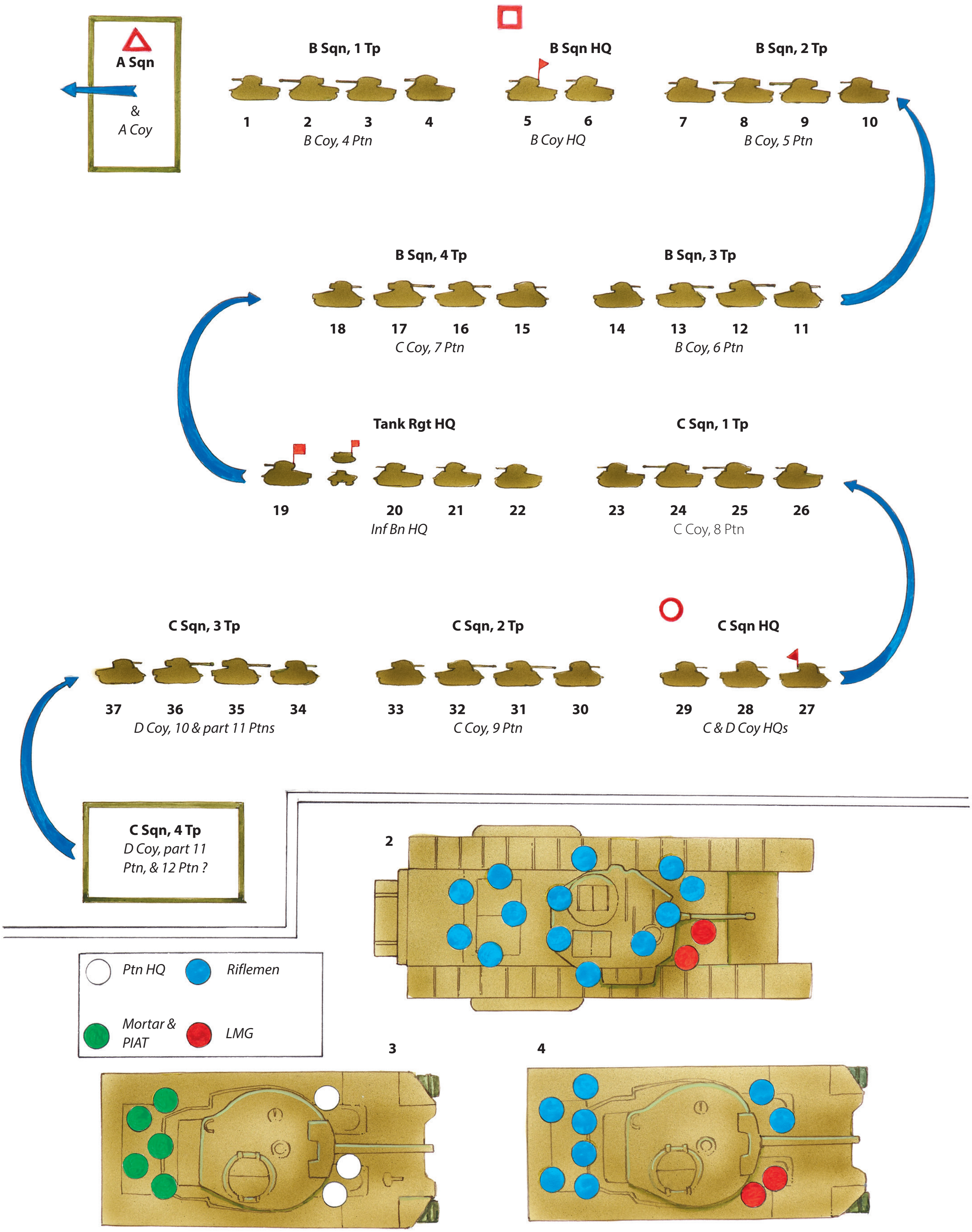
B Sqn, 1 Tp/*B Coy, 4 Ptn:* (Tank 1) *ptn HQ minus ptn sgt: ptn cdr, orderly/runner, wireless operator (w/op) with No. 38 set, 3x 2in mortar team, 2x PIAT team = 8 men.* (Tanks 2, 3, & 4) *each one rifle section, plus ptn sgt on one = 8–10 men each.*
B Sqn HQ/*B Coy HQ:* (Tank 5, B Sqn cdr) *B Coy cdr, orderly, No. 18 set, 2x w/ops = 4 men;* (Tank 6) *B Coy 2ic, 2x orderlies, 2x stretcher-bearers (SBs) = 5 men.*
B Sqn, 2 Tp/*B Coy, 5 Ptn:* (Tanks 7–10) as Tanks 1–4, above.
B Sqn, 3 Tp/*B Coy, 6 Ptn:* (Tanks 11–14) as Tanks 1–4.
B Sqn, 4 Tp/*C Coy, 7 Ptn:* *(*Tanks 15–18) as Tanks 1–4.

Regimental/*Battalion HQs:* (Tank 19, tank regt CO) followed by inf bn CO's carrier & scout car; (Tank 20, tank regt 2ic) *4x snipers, 4x HQ defense riflemen, 2x SBs = 10 men*; (Tank 21) as Tank 20; (Tank 22) *bn intelligence section, 2x SBs = 10 men*.

C Sqn, 1 Tp/*C Coy, 8 Ptn:* (Tanks 23–26) as Tanks 1–4.
C Sqn HQ/*C & D Coy HQs:* (Tank 27, C Sqn cdr) *C Coy cdr, plus as Tank 5*; (Tank 28) *D Coy cdr, plus as Tank 5;* (Tank 29, "2nd captain") *C & D Coy 2ics, 2x orderlies, 4x SBs = 8 men.*
C Sqn, 2 Tp/*C Coy, 9 Ptn:* (Tanks 30–33) as Tanks 1–4.
C Sqn, 3 Tp/*D Coy, 10 & part 11 Ptns:* (Tanks 34 & 35) *each part of 10 Ptn HQ, plus rifle section = 13 men;* (Tank 36) *section 10 Ptn plus half-section 11 Ptn = 15 men;* (Tank 37) *part 11 Ptn HQ plus section 11 Ptn = 13 men.*

C Sqn, 4 Tp/*D Coy, part 11 Ptn plus 12 Ptn* (not illustrated). The last four crowded tanks might carry *remainder of 11 Ptn HQ plus one-and-a-half sections 11 Ptn, and 12 Ptn complete, with 13–15 men per tank.* Alternatively, 3 & 4 Tps might carry *10 & 11 Ptns,* with 12 Ptn carried as a reserve in trucks in battalion column.

(2) Approximate Churchill loading plan for 15 men, including one sitting astride gun.
(3) Approximate Sherman loading plan for 8-man platoon HQ.
(4) Approximate Sherman loading plan for 10 men.


A Sqn
&
A Coy
B Sqn, 1 Tp
1
2
3
4
B Coy, 4 Ptn
B Sqn HQ
5
6
B Coy HQ
B Sqn, 2 Tp
7
8
9
10
B Coy, 5 Ptn
B Sqn, 4 Tp
18
17
16
15
C Coy, 7 Ptn
B Sqn, 3 Tp
14
13
12
11
B Coy, 6 Ptn
Tank Rgt HQ
19
20
21
22
Inf Bn HQ
C Sqn, 1 Tp
23
24
25
26
C Coy, 8 Ptn
C Sqn, 3 Tp
37
36
35
34
D Coy, 10 & part 11 Ptns
C Sqn, 2 Tp
33
32
31
30
C Coy, 9 Ptn
C Sqn HQ
29
28
27
C & D Coy HQs
C Sqn, 4 Tp
D Coy, part 11 Ptn, & 12 Ptn ?
2
Ptn HQ
Riflemen
Mortar & PIAT
LMG
3
4

Order of Battle, Allied Forces, ETO, 7 May 1945

(British Home Forces in the UK are not listed: 7 British divisions, 5 British brigades, 1 US division, and 7 Allied brigades.)

Higher commands & formations	Location
Supreme HQ, Allied Expeditionary Force (SHAEF)	France
First Allied Airborne Army[1]	France
13th US Abn Div	
I British Abn Corps	UK
1st British Abn Div	en route Norway
1st Polish Indep Prcht Bde	
British Troops in Norway	Norway
1st British SAS Bde	
303rd, 304th British Inf Bdes	
474th US Regt'l Combat Team (ex-1st Special Service Force)	
6th US Army Group (Southern Group of Armies)	Germany
Seventh US Army	Germany
12th US Armd Div	
45th, 63rd, 100th US Inf Divs	
101st, 106th, 115th Cav Grps (Mech)	
VI US Corps	Germany
10th US Armd Div	
44th, 103rd US Inf Divs	
XV US Corps	Germany
20th US Armd Div	
3rd, 42nd, 86th US Inf Divs	
XXI US Corps	Germany
2nd French Armd Div (Div Leclerc)[4]	
36th US Inf Div	
101st US Abn Div[1]	
First French Army	Germany
I French Corps	Germany
4th Moroccan Mtn, 9th Colonial Inf, 14th French Inf Divs	
II French Corps	Germany
1st, 5th French Armd Divs	
2nd Moroccan, 3rd Algerian Inf Divs	
Detachment of French Army of the Alps[2]	France
1st French Mot Inf Div, 27th French Alpine Div	Italy
Detachment of French Army of the Atlantic[3]	France
10th, 19th, 23rd, 25th French Inf Divs	
12th US Army Group (Central Group of Armies)	Germany
First US Army	Germany
78th US Inf Div	
4th, 6th Cav Grps (Mech)	
VII US Corps	Germany
3rd US Armd Div	
9th, 69th, 109th US Inf Divs	
VIII US Corps	Germany
6th US Armd Div	
76th, 87th, 89th US Inf Divs	
Third US Army	Germany
4th, 70th US Inf Divs	
2nd, 3rd, 14th, 102nd Cav Grps (Mech)	
III US Corps	Germany
14th US Armd Div	
99th US Inf Div	
V US Corps	Germany
9th, 16th US Armd Divs	Czechoslovakia
1st, 2nd, 97th US Inf Divs	Germany
XII US Corps	Germany
4th US Armd Div	Germany
5th, 90th US Inf Divs	Czechoslovakia
11th US Armd, 26th US Inf Divs	Austria

XX US Corps	Germany
13th US Armd Div	Germany
65th, 71st, 80th US Inf Divs	Austria
Ninth US Army	Germany
11th, 15th, 113rd Cav Grps (Mech)	
XIII US Corps	Germany
35th, 84th, 102nd US Inf Divs	
XVI US Corps	Germany
29th, 75th, 79th, 95th US Inf Divs	
XIX US Corps	Germany
2nd, 8th US Armd Divs	
30th, 83rd US Inf Divs	
Fifteenth US Army	Germany
66th, 106th US Inf Divs	France
16th Cav Grp (Mech)	Germany
XXII US Corps	Germany
17th US Abn Div[1]	
94th US Inf Div	
XXIII US Corps	Germany
28th US Inf Div	
21st Army Group (Northern Group of Armies)	Germany
79th British Armd Div	
306th, 307th Brit Inf Bdes	
Czech Indep Armd Bde Grp	France
First Canadian Army	Germany
1st Belgian Inf Bde	Germany
308th Brit Inf Bde	Netherlands
Royal Netherland Bde "Princess Irene"	Netherlands
I Canadian Corps	Netherlands
1st Cdn, 49th Brit (West Riding) Inf Divs	
1st Cdn Armd Bde	
4th Brit Cdo Bde	
II Canadian Corps	Germany
2nd, 3rd Cdn Inf Divs	
4th, 5th Cdn Armd Divs	
1st Polish Armd Div	
2nd Cdn Armd Bde	
Second British Army	Germany
116th Inf Bde (Royal Marines)	
305th Inf Bde	
I British Corps	Germany
3rd Inf Div	
34th Tank Bde	
115th Inf Bde	
VIII British Corps	Germany
11th Armd Div	
5th, 15th (Scottish) Inf Divs	
1st Cdo Bde	
XII British Corps	Germany
7th Armd Div	
53rd (Welsh) Inf Div	
4th Armd Bde	
XVIII US Abn Corps[1]	Germany
5th US, 7th US Armd Divs	
6th Brit Abn Div	
8th US Inf Div	
82nd US Abn Div[1]	
6th Brit Guards Tank Bde	
XXX British Corps	Germany
43rd (Wessex), 51st (Highland), 52nd (Lowland) Inf Divs	
Guards Armd Div	
8th, 31st Armd Bdes	
301st Inf Bde	

Notes:
(1) The 17th, 82nd & 101st Abn Divs, nominally under XVIII Abn Corps and First Allied Airborne Army, were in practice shuffled between Allied armies as needed.
(2) & (3) Temporary corps-level commands formed in March 1945, to fight in the French/Italian Alps, and against German garrisons in French Atlantic ports, respectively.
(4) For morale reasons, Gen Leclerc's French 2eme DB, which included some of the earliest Free French units, never served under Gen de Lattre's French First Army, but under various US commands.

No. 77 and No. 80 WP grenades when house-clearing. To counter a tendency for platoons to "over-deploy" – i.e. to scatter too widely early in an attack, thus making control difficult – they recommended single-file formation in the advance-to-contact, as a compromise between this and any dangerous bunching.

Notes from British official publications

A comb through some of the many British government publications that were issued during 1944–45 (see Bibliography) throws up a number of specific recommendations arising from combat experience. These both identify weak points in pre-deployment training, and express frustration at the difficulty of inculcating certain lessons before troops gained real battle experience. During training in the UK they knew that nobody was actually trying to kill them, and that even the coldest, hungriest, and most exhausting 36-hour exercise would eventually end with showers, warm food, and dry beds. Once in the war zone, they were unprepared to find themselves in action for perhaps twice that long, potentially under fire all day and working most of the night, with no end in sight – to say nothing of the disorienting shock of real artillery and mortar fire and its horrible results.

Only a few of the wide range of subjects covered are selected here, under general headings. The criticisms quoted certainly applied equally to conscript

H CANADIAN INFANTRY

The Canadian Army used British-pattern uniforms, weapons, and web equipment; much of this was Canadian-made, but British-produced items were also issued in the UK and on the Continent. The most obvious differences were the greener shade of the serge battledress uniform; and the high combat boots issued to 3rd Cdn Inf Div for D-Day, and to 2nd Inf Div during winter 1944/45.

1: Corporal, Lorne Scots, 2nd Canadian Infantry Division; Netherlands, autumn 1944

The Lorne Scots (Peel, Dufferin and Halton Regt) had a unique role. It provided Defence & Employment Platoons to every Canadian division and brigade HQ (at least 17 platoons), plus the II Cdn Corps Defence Company. These large 61-man platoons were variously organized, but commonly consisted of three rifle sections and an AA section which often converted to a fourth rifle section. They secured the unit command post, escorted the CO and staff officers, and performed other duties – as batmen, runners, sick orderlies, and undertaking endless fatigues. This corporal sports the regimental shoulder title; these large titles showed a range of similar but different designs and colors, and were almost always retained on combat uniforms. Below it is the insignia of the platoon's assignment, to 5th Bde HQ (red bar) within 2nd Inf Div (blue rectangle patch). Over Canadian battledress he wears the British blanket-lined leather jerkin; the British Mk II helmet is covered with two-color Canadian camouflage netting, with a shell dressing secured beneath it; and boots, general service ("ammunition boots") are worn with Canadian web anklets. His web gear is standard; note that the four 32-rd magazines for his 9mm Sten Mk II SMG are too long for the pouches and protrude a couple of inches – late-war pouches were taller, but few were issued before VE-Day. He also carries six Bren gun magazines in a canvas carrier in his right hand.

1a: The shell dressing, carried on the helmet.

1b: The smaller first field dressing, carried in a trouser pocket provided for that purpose at the front of the right hip.

2: Private, 3rd Canadian Infantry Division; Rhineland, early 1945

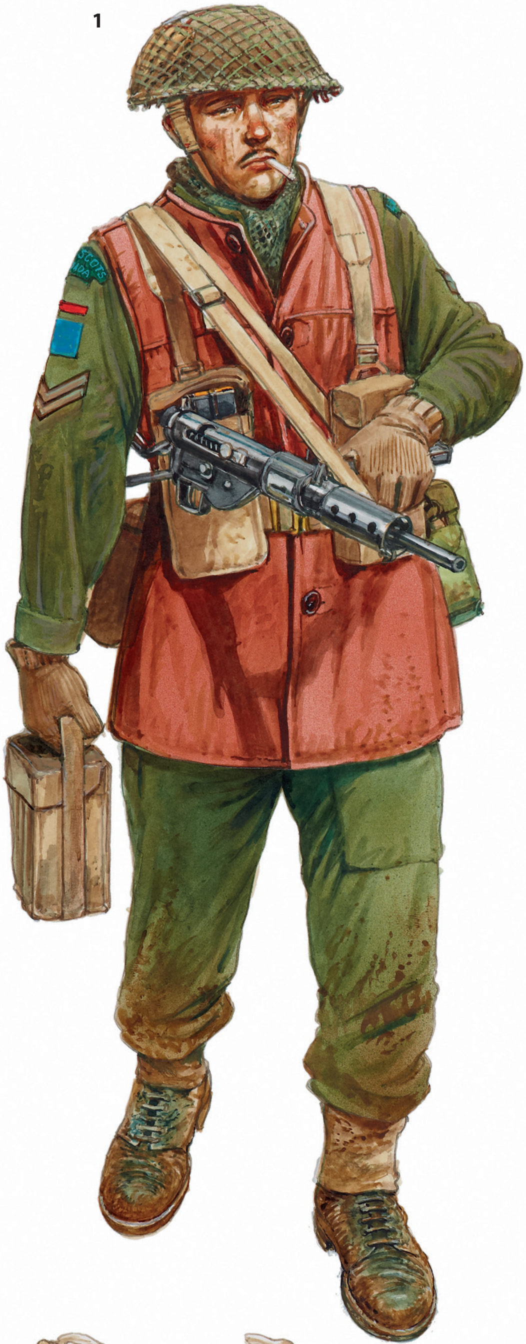
This rifleman, identified only by the division's gray-blue sleeve patch, has the Mk III helmet issued to Canada's D-Day assault division, in this case with the shell dressing tied to the back of the net by its tapes. The helmet is worn here over a wool balaclava in cold weather. This rear view shows web equipment modified for combat. The haversack/small pack has been left with company transport, and the entrenching tool has been discarded in favor of a Canadian-made D-handle general service shovel; while bulky, it proved more useful (British-made T-handle GS shovels were also issued). Below it, the rolled groundsheet/poncho tied to the shoulder braces contains extra clothes and toilet articles normally carried in the haversack. He has two British-made "strapless" water-bottle carriers—one was often used to carry the mess tins, containing a cold meal such as "bully beef" sandwiches—and a slung "respirator, anti-gas, light." He is handling one of the five-pocket cotton bandoliers which were either stowed in one of the basic pouches or slung round the body, holding 50 rounds for his No.4 Mk I rifle. Note the "3rd Div" boots, with their single-buckle gaiter flap.

2a: The balaclava had deep extensions front and back.

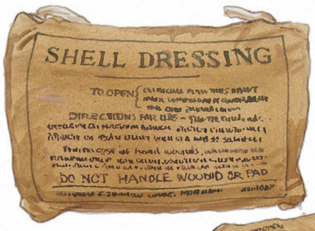
2b: As in the British Army, a 2in mortar was provided to each rifle platoon HQ and mainly used for smoke-screening, illumination, and signaling with colored flares. This compact Mk VII** with a 19in barrel was issued late in the war to replace the 26in-barrel Mk III with a larger baseplate. This mortar, rigged for slinging over the shoulder baseplate-upward, has the range sight fitted, though aiming was often done "by eye." (The asterisk or "star" in designations indicated minor modifications.)

2c: 2in mortar WP smoke round.

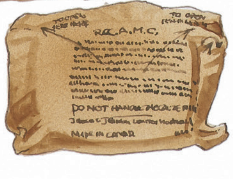
1

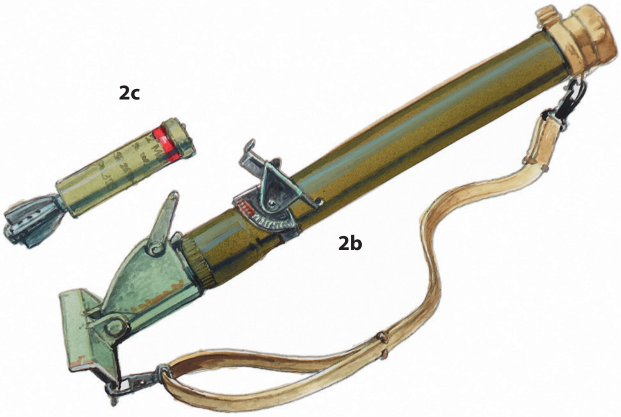


1a


SHELL DRESSING
TO OPEN
DIRECTIONS FOR USE
DO NOT HANDLE WOUND OR PAD

1b

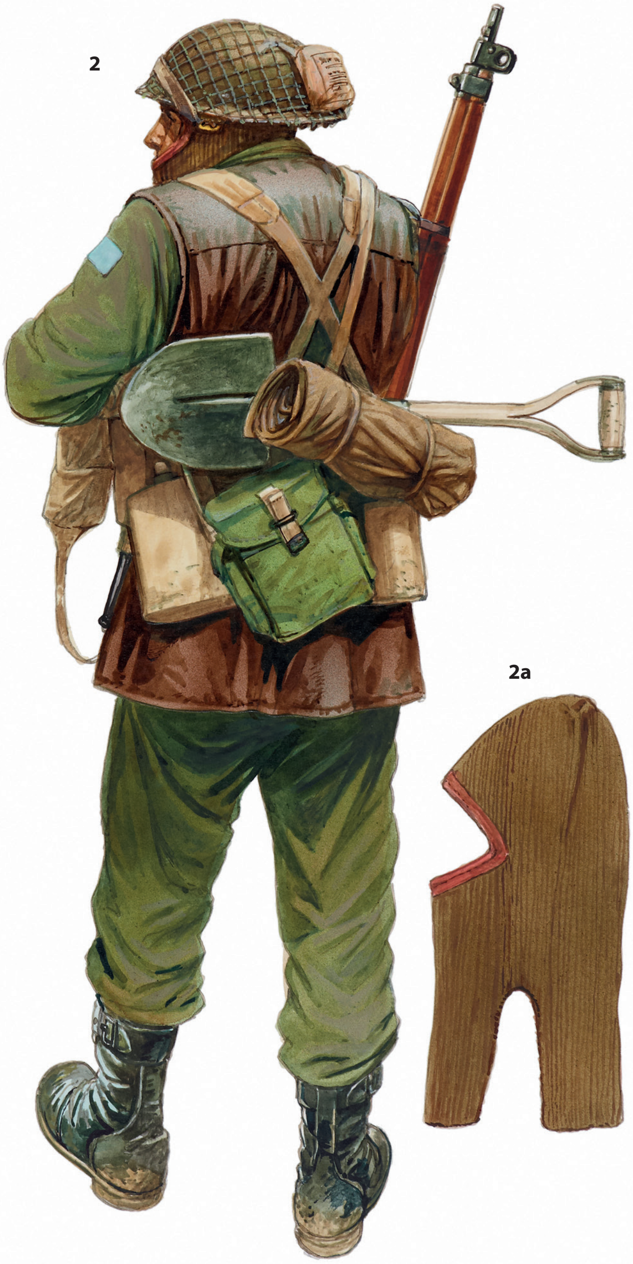

R.C.A.M.C.
TO OPEN
DO NOT HANDLE
MADE IN CANADA



2c

2b

2



2a

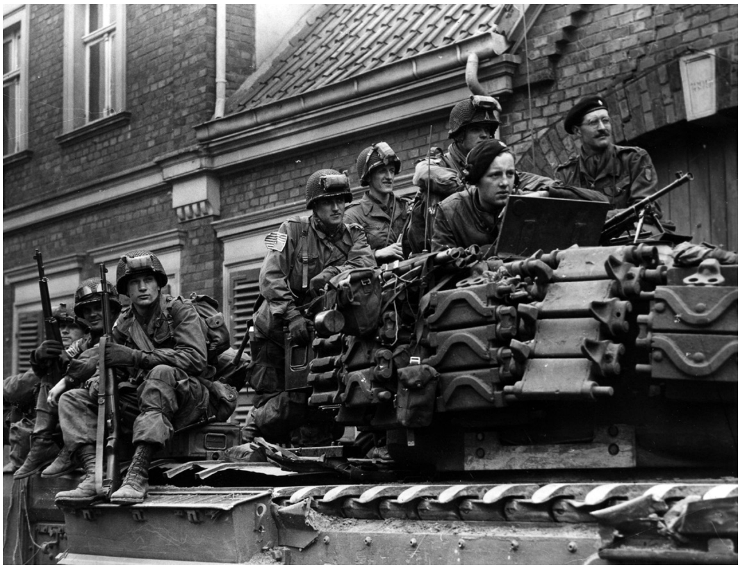
troops of average units in all the armies in the theater. (One example is the oft-repeated complaint that British troops were careless about aircraft recognition, and needlessly – and contagiously – trigger-happy. Given the chronic problem of Allied aircrew mistakenly attacking their own ground troops, this was probably inevitable.)

Digging-in, and frontline caution Repeated warnings that careless movement around positions, when not apparently in immediate danger, made troops vulnerable to snipers. Slit trenches were too often dug for comfort rather than protection – too wide, with thin parapets, and particularly with too little overhead cover. Section positions within a platoon position were dug too widely separated for easy command/control.

The attack, and consolidation Stress on importance of systematically clearing captured ground of snipers and overlooked outposts. Criticism of infantry's lack of recognition of necessarily different battle drills for fire-and-movement between (a) set-piece assaults with artillery barrage, and (b) unsupported broken fighting. Before assaults each man to carry pick or shovel plus four empty sandbags, and dig in at once. Unit AT platoon must get forward as fast as possible, as must rear-echelon carriers and jeeps with ammo, etc. One company per battalion should be held for making "counter-counterattacks." Stress on importance of speedy, relentless violence when house-clearing; reminder that German farms often had cellars under barns as well as under main houses.

The defense While men were once prone to opening fire at too long range, by November 1944 they were often reluctant to show themselves and fire small arms except in immediate self-defense, relying on MGs and artillery. Every rifleman must shoot, and be capable of a kill at 300 yards. Where possible, at night drivers, cooks etc. should provide carrying parties, and even sentries to hold the line, relieving riflemen to catch some sleep.

Marksmanship, and sniping Each company should have two 2-man sniper teams with telescopic rifle sights (the spotter with a 20-power telescope), selected for fieldcraft skills and patience as much as marksmanship; they should be excused fatigues, and employed only where their special skills were valuable. Additionally, one proven marksman per section with a standard rifle should be selected, and deployed to a flank in the assault – most German "snipers" encountered were simply ordinary riflemen willing to fight as individuals. Complaints about low standard of reinforcements' marksmanship were usually due simply to units not giving men regular opportunities to re-zero their rifles under supervision of armorer-sergeants. Very detailed advice given on snap-shooting training. Good rifle-range marksmen often "froze" in their first combat, shocked by targets that shot back; combative attitude and speedy reactions more important than pure marksmanship.



Munster, Germany, April 1945: paratroopers of US 17th Abn Div hitch a ride on a British Churchill Mk IV infantry-support tank of 6th Guards Armd Brigade. The tank has spare track plates hung around the turret sides for protection from Panzerfausts, and the turret crew have acquired a Bren LMG for defense against close-in attacks. (Tom Laemlein/Armor Plate Press)

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INDEX

References to illustrations are shown in **bold**.
Plates are shown with page locators in brackets.

ammunition/clothing/fuel/supplies, delivery of 10, 25, 26, **26**, 41, 48, 62
amphibious carriers/landing craft 21, 50, **50**, 55
Ardennes offensive 5, 6, 23, **23**, 26, 28, 39
Austria, fighting/forces in 5, 33
AVREs 39, 40, 47, **53**, 54

Baltic coast, drive to 4, 5, 39, **40**, 54
Belgium, fighting in 4, **18**, 23, **25**, 26, 38, 42, 55
Bird MC, Capt Harrison K. **43**
Bradley, Gen Omar 7, 12
breaching/crossing gear 53, **53**, 54
Breskens Pocket, assault on 49, 55
British forces (21st Army Grp) 4, 5, 6, 7, 28, 34, 35, 36, 40, 41, 42, 46, 59: AA/LAA units 36, 42–3, **42**; Airborne units 34, 36, 39, 58, 59; air-landing units 36, 38; armd units 36, **E4**(37), 39, **40**, 44, **F1, 2–3**(45), 46, **46**, 47, 48, **48**, 49, **49**, 50, **52**, 53–4, **53**, **54**, 55, 59, **62**; armies 4, 34, 39, 41, 42, 54, 59; arty units 36, 38, **38**, 39, 40, 43, 47, 48, **49**, 62; asslt (engineer) units 38, 49, **50**, **53**, 54, 55; AT units 36, 38, 48, **48**, 49, **49**, 56, **G1**(57), 62; badges/insignia/titles 36, **E4**(37), 44, **F1, 3**(45); carrier units 38, 44, **F2**(45), 54, 62; casualties/losses 34, 35, 38, 40–1, 42, 43–4, 47, 50; catering staff 62; Commando units 28, 55, 58, 59; corps 36, 48, 55; engineer units 36, 38, 40, 47, 49, **50**, **53**, 54, 55; HQ units 38, **44**, 48, 56, **G1, 3**(57); inf units 34, 35, **35**, 36, **E1, 3–4**(37), 38, 40–1, **40**, **41**, 42, **42**, 43, 44, **44**, **F1–3a**(45), 46, **47**, 48, 49, 50, **50**, 51, **51**, 52, **52**, **53**, 54, **54**, 55–6, **55**, **G1–4**(57), 58, 59, 60; medical units 36, 38, 56, **G1**(57); MG units 36, **E2**(37), 41, 47, 48, **51**; mortar units 38, 47, 48, 56, **G1**(57); parachute units 28, 36, 58; recon units 36, 41, 46, **46**, 48; reinforcements/replacements 35, 40, 42–4, 46; reserve units 52; rifle units 35, 36, **E2, 4**(37), 38, 44, **44**, 52, 56, **G1**(57), 62; SAS units 28, 58; searchlight units 42; sniper teams 56, **G1**(57), 62; strengths 40; support units 38; tank forces 18, 34, 36, 40, **40**, **41**, 46, 48, 49, **51**, 53, **53**, 54, **54**, 55, 56, **G1–4**(57), 59; training/tactics 34, 39–40, 46–7, 51, 55–6, 60; transport units 36, 50, 54; wireless operators 44, 56, **G1**(57)

Canadian forces (21st Army Grp) 4, 6, 7, 34, 35: AA sections 60; APC regt 54; armd units 36, 43, **43**, **46**, 47, **47**, 50, 53, 54–5; armies 28, 34, 36, 39, 41, 43, 52, 59; armd-car troop 50; arty units 36, 38, 43, 47, 48; AT units 47; casualties/losses **7**, 10, 24, 25, 34, 38, 43, 54; corps 36, 43, 54, 59, 60; inf units 34, **34**, 36, 42, 43, **46**, 47, **47**, 48, 49, 50, **52**, 54, 55, 59, 60, **H1–2**(61); insignia/titles 60, **H1**(61); mech inf "motor bn" 36, **43**; MG units **34**; mortar teams 60; recon units 36, **46**, 50; rocket units 38; rifle forces 38, 43, 48, 60, **H2**(61); tank units 36, 47, 60
Colonial troops 28, **D2**(29)
communications, means of 5, 15, **15**, 16, **C4–5**(17), 22, **22**, 44, **44**, 51, 56, **G1**(57)

Demars, Tpr Ed **46**
Dutch-German border, forces on 36, **E1**(37), **46**, **49**

Elbe river, crossing of 5, **5**, 44, **F3**(45), 54, 55

food, preparation/serving of 26, **26**, 44, **F2**(45)
forest/woodland fighting 6, **8**, 10, **22**, 39, **47**, 50, **51**, 52–3, **52**
France (southern), forces in 6, 32, **32**
Free French Forces (FFL) 5, 6, 7, 28, **D1–3**(29), 32–3, **32**, **33**, 58
French Alps, forces in **25**

German forces (Heer) 4, 5, 6, **6**, **19**, **26**, 28, 33, 35, **40**, 41, **41**, 42, 43, 51, **62**
ground/air recognition panels 36, **E3**(37)

Jary MC, Lt Sydney 16, 35, 40, 41, 42, 43, 47, 55

Kervenheim, assault on **54**, **55**

Maas river, clearing of 44, 47, 54
Marseilles, Free French forces in **32**
Milburn, MajGen Frank W. **6**
Montgomery, FM Bernard 34, 43, 48, 56

Netherlands, forces in 35, 36, **E2**(37), 44, **44**, **F2**(45), **48**, **52**, **53**, 60, **H1**(61)
night-time fighting 15, 16, **38**, 42, 50–2
Normandy landings/fighting in 4, **4**, 6, 32, 34–5, **34**, 47, 49

Operations: "Amherst" 28; "Astonia" 47; "Blacklock" 39, 40–1; "Blockbuster" **47**, 50, 53; "Cannonshot" 39; "Cobra" 6; "Constellation" 44; "Dragoon" 6; "Enterprise" 39; "Goodwood" 47; "Infatuate" 55; "Market-Garden" 4, 26, 38, 39, 44; "Plunder" 39; "Spring" 34; "Switchback" 49; "Torch" 32; "Totalize" 54; "Veritable" 39, 44, **F1**(45), 47, 48, 50, 54, 55

Patton, LtGen George 7, 14, 26
Polish forces 36, **E2**(37), 43, 58, 59

Red Army forces 5, **5**, 39
Rhine river, clearing/crossing of 4, 5, 11, 21, 26, **38**, 39, **42**, 47, **50**, 54, 55
Rhineland, forces/fighting in 36, **E3**(37), 39–40, 44, **F1**(45), 49, 50, 60, **H2**(61)
Roosendahl Canal, forces at **43**

"Siegfried Line" 4, 26–8, **27**, 30–1, 39, 51
smoke flares/grenades/rounds 12, **B3–3a**(13), 14, 15, 16, 26, 31, 56, 60, **H2c**(61)

tank destroyers 10, 11, 12, 18–19, **18**, **19**, 20, 33, 47
tank-infantry cooperation 14–16, **C**(17), 18, **19**, 27, 39, 46–8, 50, 52–3, **53**, 54, 55
tank-riding 15, 16, **C**(17), **44**, 47, **47**, 54, 56, **G1–4**(57), **62**
tanks (British/Canadian) 18: losses 47, 50; roles of 46, 50, 51, 52–3, types: Churchill 39, **41**, 46, 49, **51**, **53**, 54, 56, **G2**(57), **62**; Comet 39; Crab "flail" 39, 40, 47, **52**, 54; Crocodile flamethrower 39, 47, **53**, 54; Cromwell 39, 40, 46, 49; Crusader 48; DD 54; Ram 54; Sherman **44**, 46, 47, **47**, 50, 54, 56, **G1, 3–4**(57); Sherman Firefly 39, 46, 56; Stuart 46; Valentine 49
tanks (Free French) 33; tanks (German) 5, 11, 14, 16, 19, 20, 26, 30, 46, 47, 49
tanks (US) 10, 11, 18, 20: allocation of 25–6; roles of 11, 14–16, **C**(17), 18–19, 20, 30, 31, 50; transport of 21, **25**; types: "dozer tank" 31; M4 Sherman 11, 14, **14**, 15, 16, **C**(17), 18, 19, 25–6, **25**, 31, 49; M5A1 Stuart 11, 16, 18; M24 Chaffee 11; M26 Pershing 11
Tassigny, Gén d'armée Jean de Lattre de 7, 32
tractor-trucks and tractors 21, **25**
trucks and trailers 10, 20, 21, 25, 33, 54

uniforms/clothing/gear: British **35**, 36, **E1, 3–4**(37), 41, 44, **F1–3**(45), **54**, 55; Canadian **43**, 60, **H1–2a**(61); Free French 28, **D1, 2–3**(29), **32**, **33**; Polish 36, **E2**(37); US **4**, 5, **5**, **6**, **7**, 8, **8**, **A1–2c**(9), **10**, 11, 12, **B1–3a**(13), 18, **18**, **19**, **23**, **24**, **25**, 26, **27**, 28, **D1**(29), 36, **E1, 4**(37)
US forces: AAA units 7, 10, 24; Airborne units 6, 7, 10, 11, 12, 58, 59, **62**; armd units 6, 7, **7**, 14, **14**, 18, 20, 21, **22**, 24, 25, **25**, 26, 30, 58, 59; armies 5, 6, **6**, 7, 14, 17, 18, 21, 26, 27, **27**, 35, 58, 59; army groups 4, 5, 6, 7, 26, 58; arty units 7, 8, 10, 11, 16, 18–19, 21, 22, **22**, 23, **30**, 31; AT units 7, 19, 20; cannon units 7, 22; casualties/losses 6–7, **7**, 34; cav grps (mech) 7, 11, 58, 59; Combat Cmds 18, 33; corps **6**, 7, 21, 22, 27, 58, 59; engineer units 7, 8, 10, **10**, 18, 20–1, 27, 31; heavy wpns units 7; HQ units 7, 8, 16, 18, 19, 20, 22, **23**; inf units 5, **5**, 6–7, 7–8, **8**, 10, **10**, 14, 15, 18, 20, 21, 22, 23, **24**, **26**, 30–1, 58, 59; MG units **8**, **10**; medical units 7, 8, 10; MP units 23–4; pioneer units 19; Rangers **4**; RCTs 8, 10; recon units 16, 18, 19, **25**, **27**, 33; reinforcements/replacements 23–5; reserve units 7, 10, 18, 33; rifle units 7–8, 10, 12, **B1, 2**(13), 14, 15, 16, 20, **23**, 24; service/supply units 7, 10, 20; strengths 6, 7, 10, 18, 24, 25; tank units 8, 10, 14, **14**, 15, 16, 18, 20, 21, 25–6, **25**; tank-destroyer units 8, 10, 11, 18, **18**, 19, 20, 23–4; transport units **8**, 10, 21; wpns units 8, **8**, 10, 15, 20
US Navy units 21

vehicles: British/Canadian: AFVs 53; APCs 36, 38, 39, 40, **40**, **41**, 46, 47, 50, **50**, **52**, 54–5, **54**, 56, 62; armd cars 46, 50; halftracks 41, 48, **52**, 54; jeeps **41**, **52**, 62; scout cars **41**, 44, 46, 56; Free French 33; US: APCs 8, **10**, 11; armd cars 19; field ambulances **7**, 36, 38; halftracks 11, 14, 19, 20, 33; jeeps **5**, **7**, 10, 19

Waal river, forces at **48**
weapons (British/Canadian): AA guns 42, **42**; arty 23, 38, **38**, 39, 40, 43, 49, **49**, 50, 54; AT guns/projectors 19, 20, 38, 44, 46, 47, 48, **48**, 49, 50; bayonets **43**; cannon 50; carbines 39; flamethrowers 39; grenades 36, 44, **F1**(45), 50, 55, 60; MGs **34**, 36, 38, 39, **41**, 50, **51**, 53, 55, 62; mortars 26, 36, 38, 39, 43, 44, 50, **53**, 54, 60, **H2b**(61); rifles 39, **43**, 44, **F1, 3–3a**(45), 60, **H2**(61); 62; rockets 38; SMGs 36, **E1**(37), 39, 55, 60, **H1**(61)
weapons (Free French): arty 33; carbines 28, **D3**(29); daggers/knives 28, **D3**(29); grenades 28, **D1–1a**(29), **32**; MGs 28; pistols 28, **D3**(29); rifles 28, **D1**(29), **32**, 33; SMGs 28, **33**
weapons (German): arty 16, 20, 26, 30, 49, 50, 53; AT guns/projectors 14, 15, 16, 20, 27, 28, 30, 41, 49, 50, 53, 62; grenades 20; MGs 5, **22**, 28, 30, 31, 41; mines 16, 41, 48, 50, 52, 53; mortars 5, 16, 19, 20, 28, 30, 31, 41, 50
weapons (Polish): rifles 36, **E2**(37)
weapons (US): AA guns 11, 23; AAA guns 11; arty 11, 21–3, **22**, 26, 27, **30**, 31, 33, 39; AT guns 11, 19, 20, 31, 49; bazookas 8, **A2**(9), 11, 20, 27, 30, 31, 49; carbines 8, **8**, **A1**(9), 11, **15**, **27**; flamethrowers 27, 30, 31; grenades 12; MGs 8, 10, **10**, 11, 16, **C1–2**(17), 20, 27; mines 16; mortars 7, 8; pistols **6**, 8; pole charges 30; rifles 8, **9**, 11, 12, **B2, 3**(13), **18**, 23, **23**; SMGs **4**, 11, **27**
Wesser river, forces approaching **41**

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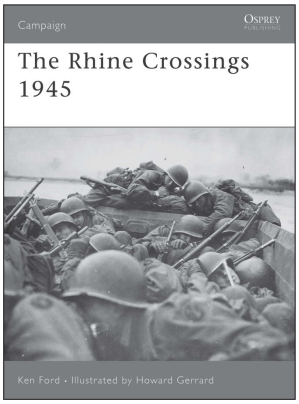

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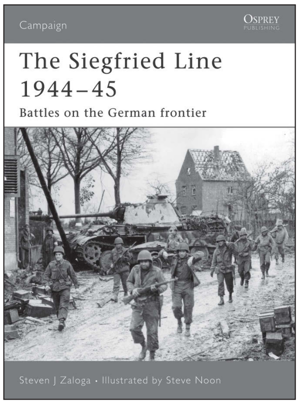

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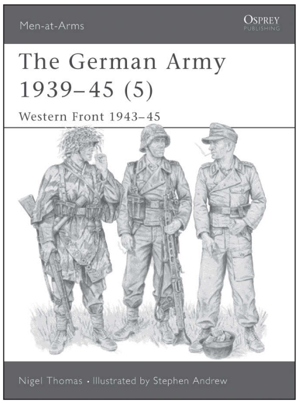

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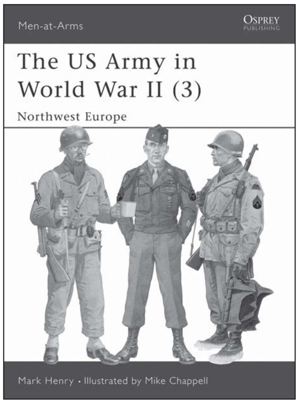

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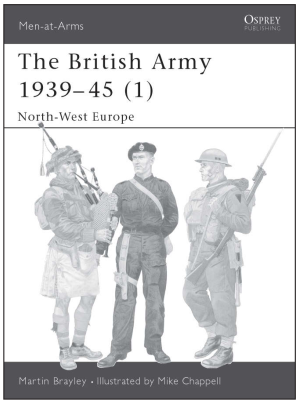

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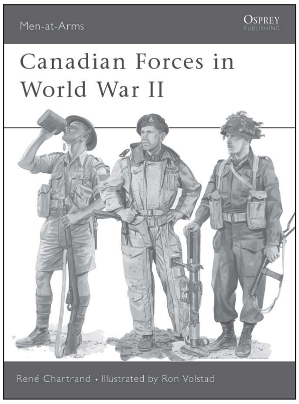

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